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ABSTRACT

Recommendations for meeting health manpower and training facility needs in Maryland are made, based on the included Coggeshall report. Demand for health personnel is contrasted with estimated future supplies. A third medical school should be planned and dependence on foreign physicians reduced. Rural areas should improve their own health services. The nursing shortage will be reduced by expanding associate degree programs but other degree and licensed practical nurse programs should be continued. An increase in the number and productivity of dentists can be made by the creation of a second dental school and encouragement of auxiliary training. Information on the needs for allied health professionals should be gathered. Appendixes include demographic tables on doctors and nurses; a list of institutions offering instruction in allied health professions; a counter statement by the State Medical and Chirurgical Faculty; a supplementary pharmacy report recommending expansion of the School of Pharmacy, reduced dependence on out-of-State pharmacists, and development of experimental training programs; a proposal for a State college of allied health sciences; and an admissions report of the Medical School of the University of Maryland. (MS)

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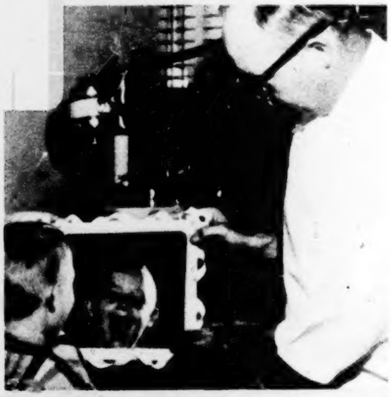
A PROJECTION OF MARYLAND'S HEALTH MANPOWER NEEDS THROUGH THE 1980'S



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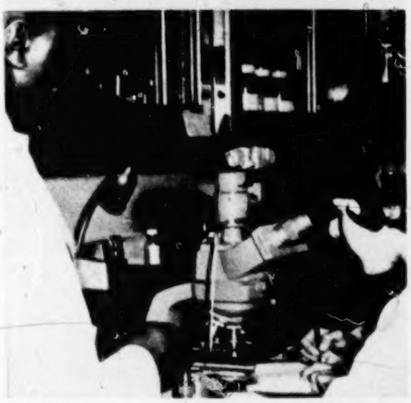

MARYLAND COUNCIL FOR
HIGHER EDUCATION
BALTIMORE, MARYLAND

JANUARY, 1969

STATE OF MARYLAND

MARYLAND COUNCIL FOR HIGHER EDUCATION
2100 GUILFORD AVENUE, BALTIMORE 21218

January 20, 1969

The Honorable Marvin Mandel
Governor
State of Maryland
State Office Building
Annapolis, Maryland 21401

Your Excellency:

The Maryland Council for Higher Education has the honor to present to you this report, "A Projection of Maryland's Health Manpower Needs Through the 1980's" as requested by the Governor's Office.

This study reflects careful consideration given to health manpower needs by far more citizens of the State than those who are members of the Council as such. The best available professional personnel prepared the basic study which is Part III of this report, The Consultants' Report. That, in turn, was carefully reviewed by a comprehensive committee of Maryland citizens who represent the many professional pursuits involved in the business of providing health services and care throughout the State in addition to knowledgeable and interested lay citizens. The Committee's Report is Part II of this overall study. Both the consultants and the committee provided the Council with recommendations upon which to base its reply to you as found in Part I of this document.

The Council notes with regret the retirement of Roy Tasco Davis and the passing of Dr. Sherman E. Flanagan, two former Council members whose contributions to this study and others will be sorely missed.

It is our hope that your review of this study will result in appropriate legislation, wherever needed, and adequate financial support in order to enable the citizens of the State of Maryland to receive health services and care which are representative of the best in the nation.

Respectfully yours,

Dr. G. Russell Tatum, Chairman
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A PROJECTION OF MARYLAND'S HEALTH MANPOWER NEEDS THROUGH THE 1980's

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Miss Susan L. White, Research Assistant, formerly with Joint Center for Urban Studies, Harvard–M.I.T.

PREFACE

The genesis of this report:

In recognition of the concern of the State for insuring the continued development of skilled medical manpower to meet the needs of Maryland's citizens for adequate health care; in specific response to the expressed interest of the Maryland General Assembly through joint resolution; and in response to a directive from the Governor's office, the Maryland Council for Higher Education has conducted an extensive study of the health manpower problem. The Council has prepared this report for the consideration of the Legislature, the Governor, and the many individual and responsible State officials who have expressed their interest and concern; for the information of the private and professional citizens who are the consumers and the providers of health care; and for those institutions which will be called upon to provide the programs for producing the essential health manpower.

In conducting this study and preparing this report, the Council, the Council's Committee on Health Manpower, and the professional consultants to the Committee have endeavored to present the facts, the projections, the conclusions, and the recommendations as accurately, clearly, and concisely as is possible under the circumstances. The conclusions are drawn from what the Council considers to be the best estimate of Maryland's needs for health manpower in the 1980's and 1990's. We believe that this study provides a firm basis for action to meet these needs.

The Council's recommendations specify the steps which must be taken in the immediate future to insure the availability of proper health care for our citizens; to insure Maryland's continued, appropriate contribution to the national requirements for health manpower; and to insure Maryland's continued leadership in advancing the growth of the health sciences and professions.

The Council began its study with a review of the 1962 report of the Committee on Medical Care of the Maryland State Planning Commission and inquired into the progress toward meeting the recommendations of that report. The Council noted that that study covered the period to 1975; that it did not go beyond the consideration of the preparation of physicians; and that additional facilities for the preparation of physicians, dentists, and other health personnel might be required to meet Maryland's needs beyond 1975. Considering the lead time for the development of such facilities to be approximately ten (10) years, with first graduates of any new medical school entering practice some sixteen (16) years subsequent to ground breaking, the Council determined to launch a full scale study of the need for additional facilities to meet the demands for health manpower through the 1980's.

In the fall of 1966, the Council established an ad hoc Medical Manpower study committee under the chairmanship of Ellery B.

Woodworth, secretary of the Council. Thirty distinguished Marylanders drawn from the health professions, the academic community, and the citizenry were appointed to the committee to direct the conduct of the study.

Representatives were selected from all segments of the tri-partite structure of higher education, from health agency personnel on the State and local levels, from the State Planning Commission and the State Department of Education. The names of the committee members are included on page iii through vi of this report.

In a series of meetings spanning the fall of 1966 and spring of 1967, the Committee examined further the 1962 report of the State Planning Commission and the report of the Sub-committee on the Expansion of Medical School Facilities of the Planning Council of the Board of Health and Mental Hygiene, approved by that Board on December 18, 1964. Data on current enrollment were requested from the University of Maryland and the Johns Hopkins University Medical Schools. These institutions also supplied evaluations with respect to the adequacy of existing facilities for meeting physician manpower needs through 1975 and the lead time required for the establishment of new medical education facilities.

In considering a plan of action, the Committee on Health Manpower determined that any conclusions or recommendations must be based on a careful analysis and projection of Maryland's requirements for health profession personnel in the 1980's. Recognizing that such a study would require the full-time services of a staff of experts for several months, the Committee, through the Council, requested special funds for a study team and set about the task of establishing the parameters of the study and locating the best qualified man to direct the research effort.

The Chairman met with the President of the Association of American Medical Colleges for the purpose of gathering recommendations, and, after a series of inquiries, discussions and interviews, determined to make every effort to attract the services of Dr. Lowell T. Coggeshall, Vice President of the University of Chicago, former dean of the University of Chicago Medical School, the author of a report evaluating the needs of medical education in the United States,* and a recognized national authority on the problems of health manpower.

The Committee was fortunate in Dr. Coggeshall's acceptance and in his selection of additional staff, Dr. Timothy D. Baker, Dr. James E. Cassidy, Dr. Jean D. Galkin, and Miss Susan White, to assist him in the conduct of the study.

Dr. Coggeshall reported to the Committee at regular intervals throughout the summer and fall of 1967. The consultant team presented preliminary reports of their findings in the several areas of investigation to the Committee, to the Council, and to interested members of the Legislature at meetings on December 13 and 14, 1967. Dr. Coggeshall presented the final report in January, 1968 and throughout the next several months the Committee met regularly to consider the material presented, to discuss the conclusions and recommendations of the consultants and to determine what final recommendations the Committee would make to the Council.

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* ***Planning for Medical Progress Through Education,*** **A report to the Executive Council of the Association of American Medical Colleges, Lowell T. Coggeshall, M.D., Association of American Medical Colleges, April 1965.**

The Committee recommendations (see pages 2-1 to 2-8) were forwarded to the Council.

At meetings in the late summer of 1968, the Maryland Council for Higher Education discussed the many implications of the Coggeshall report and the Committee's recommendations. Final action was postponed, however, in view of the imminent expansion of the Council in accordance with legislation enacted during the 1968 session of the General Assembly, to include representatives of the several institutions of higher learning directly involved in providing educational programs in the health professions. Final action was taken at a meeting of the Council on November 1, 1968 after the new Council members, Dr. Lincoln Gordon, President, Johns Hopkins University; Dr. Louis Kaplan, Board of Regents, University of Maryland; Mr. Edmund Mester, Executive Director, Board of Trustees of State Colleges, had had an opportunity to become thoroughly familiar with the subject, and after a meeting with Dr. Eugene H. Guthrie, Staff Director of the Maryland Comprehensive Health Planning Agency, and Mr. Vladimir Wahbe, Director of the State Planning Department.

I believe I speak for every member of the Maryland Council for Higher Education in extending a very special note of appreciation to each member of the *ad hoc* Committee and of the consultant team for his generous contribution to the development of this report.

I know that all of us on the Committee were inspired by an appreciation of Maryland's historical role in the advancement of medicine and by a determination that this role and this position of leadership should not be lost through a failure to plan for the future. We took note of Dr. Coggeshall's repeated warning that the delivery of health services in the United States will undergo revolutionary reform during the next few decades and that, if it is to meet the challenge, the medical school of the future must, in its design and function, recognize these reforms. As Dr. Coggeshall's report indicates, we should consider in planning for the future, not only the demand for health services and the anticipated reforms in the delivery of these services, but also the need for a more integrated approach to the education of all health personnel.

It may well be that the "multi-disciplinary, university based, health sciences complex", will become the appropriate educational design for the future. Whether this be so or not, it was the genuine desire of those on the *ad hoc* Committee, and it is the determination of the Maryland Council for Higher Education that the steps taken in Maryland to meet these challenges in medicine be started early enough and with sufficient thought and financial commitment to insure our pointing with pride in 1990 to the foresight and the freshness of the planning for the future development of our institutions for medical education which we do today.

Ellery B. Woodworth,
Chairman
Ad Hoc Committee on Health Manpower
Secretary
Maryland Council for Higher Education

PART I.

THE COUNCIL'S RECOMMENDATIONS

RECOMMENDATIONS OF THE MARYLAND COUNCIL FOR HIGHER EDUCATION ON PHYSICIAN MANPOWER AND TRAINING FACILITIES WITH RESPECT TO THE MARYLAND HEALTH MANPOWER REPORT

Along with the Committee and its Consultants, the Maryland Council for Higher Education strongly endorses the recommendation that planning begin without delay toward meeting the current and future need for physician manpower.

The Council agrees with the report of its consultants and its Committee that a shortage of doctors can be expected in Maryland by 1980. Further, it agrees with the position of the Medical and Chirurgical Faculty that a shortage of doctors currently exists. And, finally, the Council is in agreement with the finding that the distribution of physicians in the State of Maryland is uneven.

In meeting the need for physicians, the Council places its *first* priority upon and recommends that–

1. ADEQUATE SUPPORT FOR EXISTING MEDICAL SCHOOLS BE PROVIDED WHILE PLANS ARE MADE FOR ANY ADDITIONAL FACILITIES OR PROGRAMS.

In planning to meet the increased demand for physicians, Maryland should carefully weigh the cost and advantages of a new facility over against the possible economies of expansion at the existent facilities of the University of Maryland Medical School and the Johns Hopkins Medical School.

Action Proposals. The Council recommends that–

2. THE UNIVERSITY OF MARYLAND INCLUDE IN ITS BUDGET A REQUEST FOR ADEQUATE FINANCIAL SUPPORT FROM THE MEDICAL SCHOOL AND THAT THE EXECUTIVE AND LEGISLATIVE BRANCHES OF GOVERNMENT RECOGNIZE AND ACCEPT THE NECESSITY FOR SUCH SUPPORT.

3. THE UNIVERSITY OF MARYLAND AND THE JOHNS HOPKINS UNIVERSITY PROCEED PROMPTLY TO DEVELOP PLANS FOR THE EXPANSION OF MEDICAL EDUCATION FACILITIES IN CONSULTATION WITH ONE ANOTHER AND WITH THE MARYLAND COUNCIL FOR HIGHER EDUCATION, THE STATE PLANNING DEPARTMENT AND THE MARYLAND

Action Proposals (Continued)

COMPREHENSIVE HEALTH PLANNING AGENCY. A PROGRESS REPORT ON SUCH PLANNING FOR EXPANSION SHOULD BE MADE TO THE MARYLAND COUNCIL FOR HIGHER EDUCATION BY JULY 1, 1969.

4. AS SOON AS THE EXTENT OF THE EXPANSION OF THE MEDICAL EDUCATION FACILITIES AT THE UNIVERSITY OF MARYLAND AND THE JOHNS HOPKINS UNIVERSITY BECOMES SUFFICIENTLY DEFINITIVE TO ASCERTAIN WHETHER OR NOT THE PHYSICIAN MANPOWER NEEDS OF THE 1980's ARE LIKELY TO BE MET, THE MARYLAND COUNCIL FOR HIGHER EDUCATION IN COOPERATION WITH THE UNIVERSITY OF MARYLAND, THE JOHNS HOPKINS UNIVERSITY, THE STATE PLANNING DEPARTMENT, THE MARYLAND COMPREHENSIVE HEALTH PLANNING AGENCY AND OTHER INTERESTED AGENCIES AND INSTITUTIONS CONSIDER THE INITIATION OF A DETAILED FEASIBILITY STUDY OF A POSSIBLE THIRD MEDICAL SCHOOL. THIS STUDY SHOULD EXPLORE IN DEPTH SUCH ITEMS AS SIZE, LOCATION, DESIGN, COST, STAFFING, INSTITUTIONAL AFFILIATIONS, AND ITS RELATION TO OTHER HEALTH PROFESSION TRAINING PROGRAMS.

RECOMMENDATIONS OF THE MARYLAND COUNCIL FOR HIGHER EDUCATION ON DENTAL MANPOWER AND TRAINING FACILITIES WITH RESPECT TO THE MARYLAND HEALTH MANPOWER REPORT

The Council recognizes the need for increasing the productivity of the existing dental manpower in Maryland and recommends that–

1-a. THE UNIVERSITY OF MARYLAND INCLUDE IN ITS BUDGET A REQUEST FOR THE NECESSARY RESOURCES TO ENABLE ITS SCHOOL OF DENTISTRY TO EDUCATE THE DENTISTS IN THE MORE EFFECTIVE USE OF DENTAL AUXILIARIES.

1-b. THE UNIVERSITY OF MARYLAND BE GIVEN ADEQUATE SUPPORT TO ENABLE ITS SCHOOL OF DENTISTRY TO IMPLEMENT ITS PLAN OF ENROLLMENT EXPANSION AND CURRICULUM IMPROVEMENT.

To make these recommendations operable, the dental law of Maryland must be modified in order to allow the delegation of clinical procedures to dental auxiliaries educated and trained for that purposee.

The Council further recommends that–

2. THE GOVERNING BOARDS AT APPROPRIATE LEVELS PLAN TO INITIATE BACCALAUREATE PROGRAMS IN DENTAL HYGIENE, AND THAT THE COMMUNITY COLLEGES PLAN PROGRAMS IN DENTAL HYGIENE, DENTAL ASSISTING, AND DENTAL LABORATORY TECHNOLOGY.

As a *second* priority, the Council recommends that–

1. THE UNIVERSITY OF MARYLAND IN CONJUNCTION WITH THE MARYLAND COUNCIL FOR HIGHER EDUCATION AND THE STATE PLANNING DEPARTMENT BEGIN NOW THE PLANNING FOR A SECOND DENTAL SCHOOL SO THAT A REPORT OF PROGRESS MAY BE MADE TO THE COUNCIL IN TIME FOR CONSIDERATION BY THE COUNCIL FOR INCLUSION IN ITS NEXT ANNUAL REPORT, THAT IS, BY JULY 1, 1969.

RECOMMENDATION OF THE MARYLAND COUNCIL FOR HIGHER EDUCATION ON NURSE MANPOWER WITH RESPECT TO THE MARYLAND HEALTH MANPOWER REPORT

In considering the report of its committee and the consultants, the Council recognizes two outstanding problems in supplying adequate nursing manpower to the community: (1) The shortage of students interested in enrolling in nursing education programs and (2) the shortage of adequate faculty. To staff additional nurse training facilities, the Council recommends that—

> EVERY EFFORT BE MADE BY THE APPROPRIATE PUBLIC AND PRIVATE EDUCATIONAL INSTITUTIONS AND MARYLAND HOSPITALS TO RECRUIT CANDIDATES TO THE NURSING PROFESSION.

The Council also wishes to be recorded as endorsing the recommendation of its committee that the Johns Hopkins School of Nursing, presently offering a diploma program in nursing, be encouraged to convert this program to a baccalaureate program.

The Council further recommends that—

> ADDITIONAL BACCALAUREATE PROGRAMS IN NURSING BE CONSIDERED WHERE THE NEED CAN BE POSITIVELY ESTABLISHED AND THE REQUIRED FACULTY PROVIDED.

RECOMMENDATIONS OF THE MARYLAND COUNCIL FOR HIGHER EDUCATION ON MANPOWER AND TRAINING FACILITIES IN THE ALLIED HEALTH PROFESSIONS WITH RESPECT TO THE MARYLAND HEALTH MANPOWER REPORT

The Maryland Council for Higher Education generally endorses the recommendations of its Committee in the area of the Allied Health Professions. However, inasmuch as the Council's immediate concern is for the provision of adequate manpower in the Allied Health Professions, it is incumbent upon the Council to make specific recommendations which have a direct bearing upon the preparation of the essential personnel. Therefore, the Council recommends that—

1. GOVERNING BOARDS AND ALL INSTITUTIONS UNDER THEIR JURISDICTION WHICH PROVIDE OR WILL PROVIDE PROGRAMS FOR THE TRAINING OF PERSONNEL IN THE ALLIED HEALTH PROFESSIONS BROADEN THE ACCEPTABLE PREREQUISITES FOR THE ADMISSION OF STUDENTS TO THESE PROGRAMS.

2. THE UNIVERSITY OF MARYLAND TAKE IMMEDIATE STEPS TO EXPAND THE ENROLLMENT IN THE SCHOOL OF PHARMACY TO ITS PRESENTLY PLANNED CAPACITY.

3. THE TRAINING OF PERSONNEL FOR THE ALLIED HEALTH PROFESSIONS BE UNDERTAKEN BY ALL SEGMENTS OF THE TRI-PARTITE STRUCTURE OF HIGHER EDUCATION IN MARYLAND WHEREVER IT IS DEEMED ACADEMICALLY FEASIBLE BY THE COUNCIL, THE GOVERNING BOARDS AND THE CONCERNED PROFESSIONAL FACULTIES OF THE STATE AND AFTER APPROPRIATE CONSULTATION AND COORDINATION WITH PRIVATE INSTITUTIONS PROVIDING SIMILAR PROGRAMS.

4. THE UNIVERSITY OF MARYLAND IN COOPERATION WITH THE JOHNS HOPKINS UNIVERSITY AND THE MARYLAND COUNCIL FOR HIGHER EDUCATION, AFTER APPROPRIATE CONSULTATION AND COORDINATION WITH THE PRIVATE INSTITUTIONS CONCERNED AND OTHER

Recommendations (Continued)

ELEMENTS OF THE TRI-PARTITE STRUCTURE, ASSUME THE LEADERSHIP AMONG THE PUBLIC INSTITUTIONS IN THE PREPARATION OF PROGRAMS FOR THE DEVELOPMENT OF HEALTH ADMINISTRATORS FOR THE 1980's.

MARYLAND COUNCIL FOR HIGHER EDUCATION

GENERAL RECOMMENDATIONS WITH RESPECT TO THE MARYLAND HEALTH MANPOWER REPORT

While the Council persists in its efforts to provide adequate facilities for higher education in Maryland, it is also concerned with the availability and accessibility of these facilities to *all* of the citizens of the State.

In examining the problem of health manpower, the Council is disturbed over the failure of the socially and economically under-privileged to gain their proper places with the more fortunate in rendering health services to our citizens. The Council is concerned with the waste of human resources traceable to the inadequate participation of the economically and socially disadvantaged citizen in the health professions.*

The Council believes that it is important that the health professions come to include more minority group citizens whose backgrounds have, heretofore, excluded them from the opportunity to serve. We believe that many of these citizens possess high aptitude for medical careers, although their elementary and secondary school education prepared them poorly for participation.

We believe that the potentiality of these groups warrants more favorable attention and consideration in the educational process which leads from elementary and secondary school to college and professional training in health services. For in striving to meet the needs of our people for health care, we can least afford to overlook the human resources available for the task.

The Council, therefore, recommends that—

> ALL INSTITUTIONS PROVIDING PROGRAMS IN MEDICINE AND THE ALLIED HEALTH PROFESSIONS INSTITUTE BROADLY-BASED RECRUITMENT PROGRAMS DESIGNED TO ATTRACT MORE ECONOMICALLY AND SOCIALLY DISADVANTAGED YOUTH WHO ARE CURRENTLY ENROLLED IN ELEMENTARY AND SECONDARY SCHOOLS, ACQUAINTING THEM EARLY IN THEIR EDUCATIONAL CAREERS WITH THE REQUIREMENTS OF AND OPPORTUNITIES FOR PARTICIPATION IN THE GENERAL FIELD OF MEDICINE AND THE ALLIED HEALTH PROFESSIONS.

> GOVERNING BOARDS OF ALL INSTITUTIONS OFFERING PROGRAMS DESIGNED TO FULFILL THE MANPOWER NEEDS IN THE HEALTH PROFESSIONS ARTICULATE AND ENFORCE POLICIES WHICH GUARANTEE THE ADMISSION

***See Appendix I of the Consultants' Report**

OF QUALIFIED MEMBERS OF ECONOMICALLY AND SOCIALLY DISADVANTAGED GROUPS TO SUCH PROGRAMS.

IMMEDIATE CONSIDERATION BE GIVEN BY THE GOVERNOR AND THE LEGISLATURE TO THE PROBLEM OF PROVIDING ADEQUATE FINANCIAL SUPPORT IN THE FORM OF SCHOLARSHIPS TO MEMBERS OF ECONOMICALLY AND SOCIALLY DISADVANTAGED GROUPS IN ORDER TO INSURE THEIR REPRESENTATIVE PARTICIPATION IN PROGRAMS DESIGNED TO FULFILL THE MANPOWER NEEDS IN THE HEALTH PROFESSIONS IN MARYLAND.

PART II.

THE COMMITTEE'S RECOMMENDATIONS TO THE COUNCIL

PHYSICIAN MANPOWER AND TRAINING FACILITIES IN MARYLAND

The Committee's Recommendations:

1. This Committee agrees with the report of its consultants that a shortage of doctors can be expected in Maryland by 1980. The Committee strongly endorses the recommendation of its consultants that planning begin without delay toward meeting the increased demand for physicians.

2. This Committee recommends that planning begin immediately for the expansion of present medical school facilities and a possible third medical school.

3. This Committee recommends that in planning to meet the increased demand for physicians, Maryland should carefully weigh the costs and advantages of a new facility against the possible economies of expansion at the existent facilities at the University of Maryland Medical School and Johns Hopkins Medical School.

4. This Committee recommends that in planning for additional facilities Maryland should consider carefully the probable evolution in the delivery of health care and its implications for education, since it may be that the medical schools designed to meet the needs of the 1980's will be substantially different from present facilities.

5. This Committee recommends that no new medical school facility be constructed except in academic and geographical association with a university complex.

6. This Committee recommends that adequate support for existing medical schools be assured before any additional facilities or programs are instituted.

7. This Committee recommends that long range medical manpower planning should not include reliance on large numbers of foreign medical graduates.

8. This Committee recommends that State licensing examinations should assure the uniform high quality of health services delivered to Maryland citizens.

9. This Committee notes that the distribution of physicians within the State of Maryland is inequitable. We believe that areas with shortages should assume primary responsibilities for eliminating these shortages. We recommend that health planning groups with consumer representation be set up in rural regions to plan for health services coverage in these areas of shortage. We recommend that positive efforts be made to make practice in rural areas financially and

The Committee's Recommendations: (Continued)

professionally more attractive through the provision of rent-free office space, opportunities for consultation, availability of ancillary help, alternate coverage for time-off and for continuing education.

10. This Committee recommends that student financial assistance should be continued and expanded. It further recommends that the State should direct particular attention to provisions for aid to the economically and socially disadvantaged at the secondary and collegiate level.

11. This Committee recommends that medical schools continue teaching and service programs, such as "Medic", in the outlying parts of the State.

DENTAL MANPOWER AND TRAINING FACILITIES IN MARYLAND

The Committee's Recommendations:

1. This Committee recommends immediate attention should be given to increasing the productivity of dental manpower in Maryland. This should be accomplished in two ways:
   - (a) Education of the dentist in more effective utilization of dental auxiliaries through the provision of the necessary resources to the University of Maryland School of Dentistry so that it can expand its present pilot program in auxiliary utilization education.
   - (b) Creation of educational opportunities in dental hygiene, dental assisting and dental laboratory technology. These programs should be initiated at two levels:
     - (1) A baccalaureate program in dental hygiene as part of a College of Allied Health Professions.
     - (2) Community Colleges - Dental hygiene, dental assisting and dental laboratory technology programs. These should be of one and two years in length.
2. This Committee recommends immediate attention should be given to the provision of more adequate support to the existing dental school so that it can implement its plan of enrollment expansion and curriculum improvement.
3. This Committee recommends immediate attention should be given to modifying the Dental Law of Maryland to allow delegation of clinical procedures to dental auxiliaries educated and trained for that purpose.
4. This Committee recommends that immediate steps should be taken to create state funded dental scholarships for dental auxiliary students using award criteria which will maximize the likelihood of the recipients serving in areas of need throughout the state.
5. This Committee recommends that immediate attention should be given to the development of a plan designed to attract dentists into Maryland through rent-free office space, low cost loans for the purchase of equipment, continuing education opportunities.
6. This Committee recommends that planning begin now for a second dental school so that its programming and construction can be fully coordinated and integrated with a medical school in a university-located health sciences center.

NURSES MANPOWER AND TRAINING FACILITIES IN MARYLAND

The Committee's Recommendations:

1. This Committee recommends that existing associate degree programs should expand enrollment as rapidly as possible to the planned capacity. However, no new programs should be opened unless a real need can be demonstrated and availability of qualified faculty insured.
2. This Committee recommends that hospitals should continue their programs to make hospital nursing more attractive to the large reservoir of inactive nurses.
3. This Committee recommends that the Hospital Council of Maryland should implement its proposed program to recruit, retrain, and retain nurses. Refresher courses to re-recruit inactive nurses should be continued. State support is indicated.
4. This Committee recommends that diploma nursing schools and associate degree programs should provide high school students and their counsellors with accurate and current information about nursing programs and careers in nursing.
5. This Committee recommends that no new diploma programs should be opened, but steps should be taken to ensure maintenance of current enrollment levels.
6. This Committee recommends that additional collegiate facilities be provided. The Johns Hopkins School of Nursing, the only diploma school in Maryland associated with a university, should be encouraged to convert to a baccalaureate program. Additional collegiate schools should be considered with proof of need and evidence of availability of qualified faculty.
7. This Committee recommends the establishment of an additional graduate program where considered as part of future planning.
8. This Committee recommends that practical nursing schools implement more effective student recruitment.
9. This Committee recommends that no new practical nursing schools be considered until present schools are better utilized.
10. This Committee recommends that hospitals expand their efforts to recruit inactive practical nurses.
11. This Committee recommends that vocational technical schools be encouraged to initiate nurse-aide training programs in addition to those presently offered in hospitals.

The Committee's Recommendations: (Cont.)

12. This Committee recommends that experiments with new work patterns, for more effective utilization of nurse personnel be made. These new work patterns should be part of prospective studies of patient care to determine the type of personnel best fitted for specific responsibilities.

13. This Committee recommends that studies be conducted to determine the feasibility and practicability of having nurses with special training assure expanded patient care responsibilities such as pediatric nursing, nurse-midwifery, and geriatric nursing.

14. This Committee recommends that future health planning activities in Maryland include nurse manpower planninng.

15. This Committee recommends that to facilitiate future evaluation and planning, the State Board of Examiners of Nurses have access to modern data processing facilities.

MANPOWER AND TRAINING FACILITIES IN THE ALLIED HEALTH PROFESSIONS IN MARYLAND

The Committee's Recommendations:

1. This Committee recommends that the state provide for improved methods of licensing, registration, and re-registration for the allied health professions in order to provide more adequate data necessary for educational planning.
2. This Committee recommends that the projected shortage of laboratory technicians and technologists in the 1980's should be met by efforts to bring qualified individuals into programs emphasizing the laboratory aspects of training in the health sciences. This Committee also recommends the broadening of acceptable prerequisities for admission to these programs.
3. This Committee recommends that to meet the future demand for medical secretaries, secretarial schools and colleges should be encouraged to increase their present capacity for providing this training or inaugurate new programs for the medical secretary.
4. This Committee recommends that immediate steps be taken to expand enrollment in the School of Pharmacy of the University of Maryland to its presently planned capacity. We also recommend that Maryland reduce its dependence on out-of-state pharmacists. This Committee recommends that the State of Maryland support the establishment of experimental academic programs which will supply manpower necessary for anticipated diverse needs of drug distribution and drug information and control.
5. This Committee recommends that the School of Pharmacy of the University of Maryland should undertake a continuing review of the changing role of pharmacists and the implications which these changes may have for the enrollment and enrollment capacity of the present school.
6. This Committee recommends that educational programs for environmental sanitation personnel should be made available consistent with the growing need for more highly trained people in this field.
7. This Committee recommends that a basic professional baccalaureate curriculum in occupational therapy be established immediately in Maryland and be housed in a low-tuition institution with access to a medical school faculty.

The Committee's Recommendations: (Cont.)

8. This Committee recommends that no new training programs in physical therapy be undertaken at this time but that expanded or new physical therapy programs be considered when the need is demonstrated.
9. This Committee recommends that the anticipated shortage of health administrators in the 1980's be met by planning for the initiation of appropriate training programs.

GENERAL RECOMMENDATIONS

1. This Committee recommends that immediate action be taken to increase the level of state support of research programs in fundamental, applied, and clinical sciences and in methods of delivery of medical and dental services in an effort to more effectively control disease.
2. This Committee recommends that the state provide for a continuing review of health manpower in Maryland as it relates to student recruitment and enrollment in the health professions.

PART III.

THE CONSULTANTS' (COGGESHALL) REPORT

PREFACE

"Studies of Health Manpower Needs
are Monotonously Predictable"
Science, 1 December 1967

Corporate financial statements are also monotonously predictable, but they are vital to private investors. Health manpower studies are equally vital to those responsible for investment of public funds in training health professionals.

Parts of this report may seem monotonous to some readers, as it is written for two audiences: the general public, and professionals. Therefore we urge general readers to concentrate on the introduction, recommendations, and only those sections of particular interest.

This report is not predictable. First, our findings were not anticipated. Second, we have used new methods of projection which should be of interest to other states.

On May 23, 1967 the Committee on Health Manpower of the Advisory Council for Higher Education of Maryland commissioned a study group to review health manpower in Maryland, to predict future problems, and to recommend actions to ameliorate or avert these problems.

The appointment of the study group culminated 18 months of preparatory work by the Committee. For the past five months the Maryland Health Manpower Study staff has been gathering and analyzing data, and, with the help of consultants, formulating recommendations based on the analysis.

We are indebted to many people from Maryland and from national organizations. We give special thanks to Dean William St[illegible]e, Dean Thomas Turner, Dean John Salley, and Dean Marian Murphy, who supplied us with both information and advice, and to the deans and directors of the twenty-eight nursing schools in Maryland who supplied us with new information for a cohort analysis of nursing school graduates.

Dr. Leonard D. Fenninger and Mrs. Maryland Y. Pennell of the Public Health Service, Bureau of Health Manpower were of major assistance in providing us with data including the American Medical Association data tape used by the President's Commission on Health Manpower. Mr. Eugene Levine, Mrs. Margaret D. West, and Mr. Stanley Siegel, Division of Nursing of the Public Health Service supplied us with the background information on the Public Health Service Task Force Report on Nurse Manpower.

Mr. Theodore D. Woolsey, Mr. Siegfried Hoermann, and Mrs. Geraldine Gleeson of the National Center for Health Statistics provided additional unpublished information which was of great value in predicting the demand for physician services. Mr. Christ Theodore and Mr. Gerald Sutter of the American Medical Association supplied us with code sheets and instructions to permit analysis of the AMA data on Maryland physicians.

Dr. Lee Powers, Director of Operational Studies, Association of American Medical Colleges, Dr. William Ruhe, Director, Council of Medical Education, Dr. Roy Perkins, Director, Socio-economic Division, and Dr. Harold Margulies, Assistant Director, Socio-economic Division of the AMA provided us with useful background material.

Mr. Rudolph Pendall, Gilbert Sanford, and Gertrude Retzer of the Hospital Council were most generous in making available information that they had collected on health manpower for the hospitals of Maryland. Their studies have been extremely well done and bring strength to our report.

Dr. William Peeples, Mr. Clemens Gaines, Dr. Edward Davens, Dr. Alice Tobler, and Dr. Edyth Schoenrich of the State Health Department and Dr. Robert Farber and Miss Alice Sundberg of the City Health Department provided useful advice from the standpoint of employers of health manpower in Maryland.

Dr. George Yeager, Chairman of the Planning Council for the Maryland State Board of Health gave us valuable insight from his long experience with health planning in Maryland as did Dr. Edward Stafford and Dr. William Spicer of the Heart Disease, Cancer, and Stroke Regional Program.

Dr. Russell Fisher and Mr. John Sargent, Executive Secretary of the Medical and Chirurgical Faculty were helpful in providing the viewpoint of the professional society.

Mrs. Eleanor Reese and the members of the State Board of Nurse Examiners met with the study group to provide valuable suggestions on the role of licensing and examining bodies in the field of nurse manpower.

Mr. William Eisner, Administrative Director of the Maryland Optometric Association provided useful information on optometric manpower. Mr. Balasonne of the State Board of Pharmacy provided excellent data on pharmacists' manpower. We thank Mr. Richard Mazzacone, President of the American Physical Therapy Association of Maryland for the information on physical therapy manpower.

Mr. Harold E. Donnell from the Maryland State Dental Association. Dr. John H. Michael and Mrs. Harry Sutton of the Maryland Board of Dental Examiners. Dr. Berton McCauley from the Division of Dental Health of the Baltimore City Health Department, Mr. B. Duane Moen, Director, Bureau of Economic Research and Statistics, American Dental Association and Dr. Berton Pollock of the University of Maryland School of Dentistry provided helpful suggestions on problems of dental manpower. Dr. Stanley Lotzkar, Mr. Roger Cole, Mr. James Ake, and Mrs. Mary Jane Sperberg, Division of Dental Health and Resources of the U.S. Public Health Service were extremely helpful in the provision of basic data for our study.

Dr. Sidney Kreider, resident in Medical Care, assisted in preparation of the chapter on Physician Manpower. Mr. Robert Jones, Engineer Director of the U.S. Public Health Service prepared the section on Environmental Health Personnel.

Mrs. Elizabeth Marshall of the American Nurses Association provided unpublished data on their 1966 inventory of nurses.

Throughout the study, the group had advice and help from the staff of the Advisory Council for Higher Education and the Committee on Health Manpower. Our special thanks go to Mr. Ellery B. Woodworth.

Without the help of Miss Nancy A. Stephens in expediting preparation of the many drafts, this monograph would not have been completed on schedule.

CHAPTER I

INTRODUCTION

The State of Maryland is recognized as a leader in training high caliber health professionals as well as an innovator of better systems of disease prevention and medical care.

It has demonstrated its concern about the health needs of its citizens by authorizing frequent studies of the changing medical scene. This study is an example of the state's determination to keep abreast and plan for the future. The importance of long range planning has never been more evident. The entire medical scene is changing rapidly and radically. Almost every state, on individual or regional basis, recognizes health care as one of its most important responsibilities, especially because of the growing importance that society places on health. Increases in the costs of medical care, provision of health services to the inner city, and air pollution control all engender intense public reaction.

Background

No valid or convincing judgments can be made without reviewing the principal aspects of medical education, research, and services in the nation. Over the past fifty years an almost phenomenal advancement of medical science has occurred. Although largely dominated by American research in recent years, the great accumulation of new, life-saving or prolonging measures has resulted from international concern and effort. Society has provided almost unlimited funds from its private and public coffers for medical research. Likewise, early outstanding success has resulted in almost unlimited public confidence in scientists' ability to solve the remaining medical problems.

Another, more powerful result of the advancement of medical science has been increasing public financing to meet the national goal of assuring all people that economic circumstance shall not prevent them from receiving needed medical care. Now the public expects, and is in financial position to demand, adequate care. Unfortunately, we are faced with a lamentable realization that neither these expectations or demands can be fulfilled at present. We do not have enough adequately trained manpower for the job.

Health care costs increased by 6.7 percent during the first six months of 1967, much of which was due to increases in the number of personnel. In 1950, health services were our seventh largest industry, by 1960, our third largest, and by 1975, authorities predict that they will rank first as employer of manpower.

The trends which changed the pattern of medical care have occurred principally since World War II. They have taken the physician and other health workers from their relatively passive role of emphasizing diagnosis and palliative treatment. Now they are on the offensive in the fight to prevent or cure diseases. The physician can now accomplish much, but as medical science becomes more sophisticated he needs many more well-trained assistants. The major broad trends that have outmoded earlier concepts of medical care include scientific advances, population changes, increasing individual health expectations, increasing health care demands, increasing specialization in medical practice, increasing use of technological advances and more sophisticated equipment, increasing institutionalization of health care, growth of group clinics, expanding role of government in health and rising costs. From these emerging trends comes an undeniable major need for more physicians and especially for an increasing number of supporting health personnel.

Today we have a serious imbalance resulting from almost unlimited funds for medical research with less than 1 percent allocated for research into better methods of delivering medical care and insufficient support for training of health personnel. The well-spring of talent for doctors, dentists, nurses, and other personnel lies in the universities, professional schools, and teaching hospitals. Here again we find that, largely due to financial realities, these training-centers have barely kept pace with population changes and increases.

The public has finally become aware of the seriousness of the situation. Various states and communities are attempting to institute corrective measures. More than forty communities are considering medical schools. Also, this summer the Governors' Interstate Conference on Medicaid was called in San Francisco. Its recommendations included an encouragement for each state to study the problems related to the financing and delivery of health care services. Congress, which has exhibited an increasing financial interest in medical research since 1945 has finally begun to recognize that comparable support for education and service is of equal importance. In 1967 the American Medical Association called for carefully planned expansion of medical education facilities to increase the supply of physicians. Of even greater importance, the profession has admonished its members to search for ways to increase their own productivity and efficiency.

The Pace of Change

Implicit in a predictive study is the expectation of change. The usefulness of such studies depends upon full appreciation of the impact of change. The pace of change has been rapidly accelerating over the past decades.

Change cannot be stopped. It can only be modified and/or prepared for. The essential question for society is whether it is ready to take the steps necessary to manage change, or through default end up being managed by it.

The Maryland Health Manpower Study is the first step toward managing changes expected in the field of health.

METHODOLOGY

The prediction of future demands for health services and supply of health manpower is far from a precise, routine process. We have refined older, less exact methods to provide more accurate projections. Our new techniques may be of value to other states who wish to evaluate their future manpower requirements.

Our basic method is conceptually simple.

1. We estimate future *supply* of workers by adding the expected number of graduates and inmigrants to the present supply, then subtract the losses by retirement, death, and outmigration.
2. We estimate future, economic *demand* based primarily on increase of population; secondarily on economic improvement, demographic change, planned hospital construction, and the impacts of medicare and medicaid.
3. We estimate the potential effects of changing productivity for professions for which this information is available.
4. Our final step is balancing supply and demand to determine the size of any shortages.

Although the basic methods are simple, their practical application becomes quite complex. For many professions, large blocks of data are unavailable. Approximations must be made to fill in the gaps.

Demand

Demand for non-institution-based professionals (doctors, dentists, optometrists, pharmacists) depends on the number of health services demanded per capita. National Health Survey data on the different rates of service demanded by different age, education, rural-urban, economic, and racial groups permits analysis of demographic shifts, as well as the effect of total population increase.

Demand for hospital personnel is less direct. We have used planned increases in hospital beds, plus the unmet demand estimated by Maryland hospitals.

It is important to distinguish *demand* from *need, for, in a free market society, manpower shortages are based not on needs, but on society's willingness and ability to pay (individually or collectively) for health services.*

It is one matter to say we *need* more nurses or doctors, but another matter to predict society's ability to pay for services. We are a wealthy state, but not rich enough to waste resources on health that could be better spent on education or urban renewal. Our predictions are based on the broad concerns of society rather than the more limited concerns of the health professions.

We have been cautious in adding the effects of social change to the increased demands from increased population. First, medicare has not increased the demand for medical services as rapidly as expected. Second, the state has been understandably reluctant to remove all restrictions on the medicaid program. Third, we are bothered by the fact that rates of demand for physician service did not rise from 1959 to 1964, a period of rising income. All of these uncertainties point to the need for continuing evaluation of health manpower in Maryland.

Supply

Supply has as many uncertainties as demand in projections to 1980 - migration rates may change markedly, women may leave the labor force in greater numbers in response to their husbands' rising incomes, or may return to the labor force in greater numbers in response to their own improved economic opportunities. Recruitment to schools may fall below targets. Above all, the effect of implementation of recommendations in this report will change the supply in 1980. These uncertainties re-emphasize the need for continuing, rather than sporadic, assessment of health manpower in Maryland.

Regional Planning

The state is really not a suitable unit for health manpower planning. Medical schools and other health teaching centers are really more national than local in character. Students come from many states. Graduates go to many states. Although Maryland's situation parallels most of the states, Maryland is unique in that the nation's capital is almost within its border. The doctors and hospitals of Washington serve the residents of Maryland. A study done by Ciocco some years ago showed that 15 percent of the patients of D.C. physicians were non-residents in D.C. More recent data shows that about 15 percent of births to Maryland residents occur in the District of Columbia and about 4 percent of all births to District of Columbia residents occur in Maryland. Therefore, we include in our study the Washington Standard Metropolitan Area, which contains two Virginia counties and Alexandria. (We also give total figures for Maryland alone.) We do not include other neighboring states as the interstate flow of patients is relatively small.

Our intrastate regions follow the guidelines of the State Planning Commission except that we included Cecil County with the Eastern Shore region.

National health manpower data in this report is limited to information essential for understanding Maryland's problems. Additional sources of U.S. information are - The Doctor Shortage by Rashi Fein,[1] Planning for Medical Progress Through Education by Lowell T. Coggeshall,[2] Health Resources Statistics,[3] and the Report of the National Advisory Commission on Health Manpower.[4]

President's Commission on Health Manpower

In the summer of 1966, President Johnson appointed a National Advisory Commission to "develop appropriate recommendations for action by government or by private institutions, organizations, or individuals for improving the availability and utilization of health manpower". There are several findings from this Commission's report that apply directly to problems in Maryland. It is not surprising that the recommendations of the National Commission are quite similar to those of the Maryland report, for members of the Maryland Study Group have been in close consultation with the National Group during the development of the two projects. The National Commission states: "Although the need for more physicians is urgent, cost and dangers of crash efforts to increase production appear to outweigh the benefits". The report recommends that the government provide incentives to increase the production of of new dentists. For nursing, the report stresses more appropriate utilization of nursing skills, improved salaries, more flexible hours, and better retirement provisions.

The report places considerable emphasis on attemtping to increase efficiency of the health care system. We share the concern of the President's Commission and feel that the first step toward increasing efficiency will be development and evaluation projects, trying new systems for delivery of medical care. Obviously the goal of health manpower planning is to provide the most economical mix of high, middle and low level health manpower that can provide health services of acceptable quality.

Costs of Training and Maintaining Health Professionals

One reason the Maryland Council for Higher Education is concerned with the problems of health manpower is the high cost of training health professionals. Recent studies on the cost of nursing education show that the cost of training ranged from $2,000 per graduate in the least expensive associate in arts program. The cost of educating dentists is at least double the cost of educating nurses. Physician education costs, although difficult to calculate due to the interdependence of teaching, research, and service expenses in the medical school, range from $30,000 and up for each graduate (including prerequisite undergraduate education).

As impressive as these costs are, the costs of annual support of the health professionals are of far more importance to society. Physicians, the most expensive health professionals, are in the unique position of being able to partially regulate the demands for their services. In countries where there is an "over supply" of doctors, patients are seen more frequently for a given illness than is currently the practice in the United States. The effects of creating an over supply of doctors and dentists could have the unfortunate outcome of driving up the total costs of medical care without appreciably improving quality.[5] An over supply of nurses would have less serious consequences as they cannot "manipulate" their demand, and society has less of an investment in their education.

CONCLUSIONS AND RECOMMENDATIONS
PHYSICIAN MANPOWER

A. **If current trends continue, there will be a moderate shortage of doctors in Maryland in 1980.**

Recommendation 1:

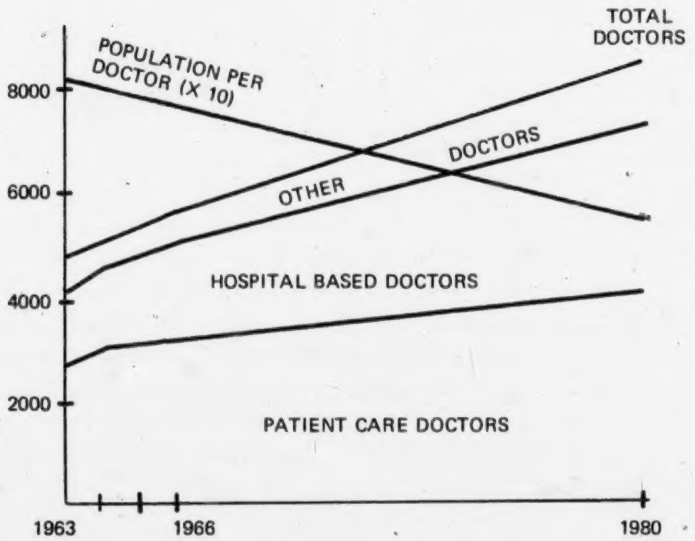
Planning should be started now for a third medical school in Maryland - not a crash effort for a new school in 1975, but rather deliberate consideration and planning.

There are great problems in securing sound financing for both capital development and long-term operating budget in selection of a site (at least three sites have been proposed during the four months of our study), and in selecting the type of school. Good will and interest are poor substitutes for adequate capital development funds and assured income. We have seen no evidence of the latter in Maryland. Communities now clamoring for a medical school should recognize that it is a terribly expensive undertaking.

There are definite economies in delay, for the medical school which is started in 1980 will be very different from the school started in 1970. Deliberated delay will save the costs of rebuilding or remodeling a school constructed too soon.

FIGURE 1–1

PROJECTED SUPPLY OF DOCTORS



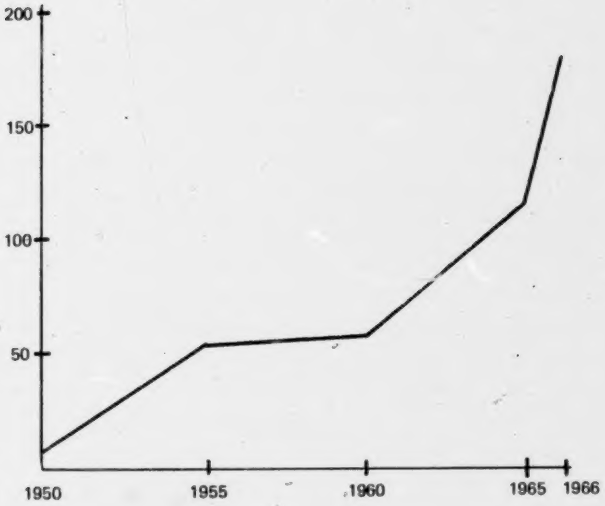
Recommendation 2:

Adequate support for existing medical schools must be assured before a new medical school is contemplated.

B. **Maryland's dependence on foreign medical graduates must be reduced.**

FIGURE 1–2

MARYLAND'S INCREASING DEPENDENCE ON FOREIGN MEDICAL GRADUATES: NEW LICENSES GRANTED PER YEAR



Recommendation 3:

Long range plans (beyond 1980) should not include large numbers of foreign medical graduates.

Recommendation 4:

Maryland hospital boards should answer the question: Does our hospital accept foreign house staff primarily to educate them, or to obtain a source of cheap labor?

Recommendation 5:

State licensing examinations should *ensure* that foreign medical graduates are in every way equal in quality to American graduates.

C. **The distribution of physicians within the State of Maryland is inequitable. Areas with shortages should assume primary responsibility for filling these shortages.**

Recommendation 6:

Health planning groups with "consumer" representation should be set up in the rural regions of Maryland to plan for health services coverage in areas of shortage.

Recommendation 7:

Recruitment of physicians for rural areas would be aided by: provisions of rent-free office space, guaranteed income, opportunities for consultation, availability of ancillary help such as public health nurses and trained office assistants, and arrangements for provision of alternate coverage for time-off and for continuing education.

Recommendation 8:

Programs of scholarship aid, in return for agreement to practice in rural areas, should be considered, even though these programs were not outstandingly successful in the past.

Recommendation 9:

Medical schools should continue their teaching and service programs such as "Medic" in the outlying parts of the state.

Obviously, every village and hamlet in rural Maryland will not have a physician. If the consumers of medical care in the rural regions of Maryland are truly concerned with the shortage of physicians, they should find some way to make practice in the rural areas financially and professionally more attractive.

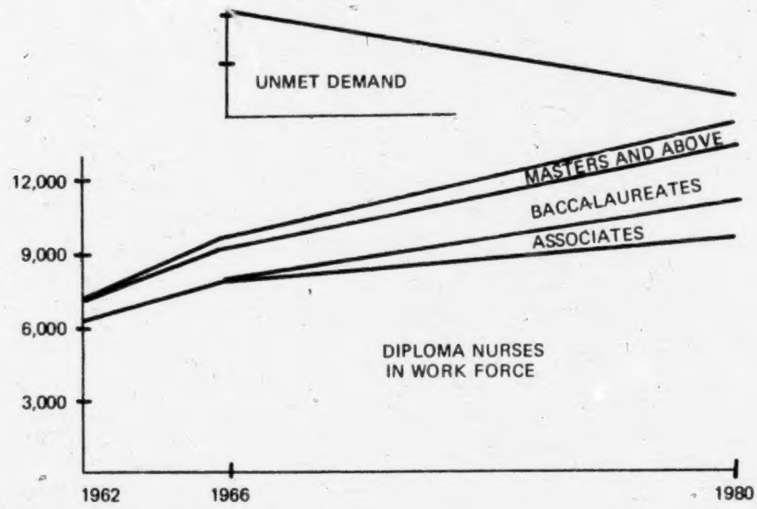
NURSE MANPOWER

A. **Today Maryland has a nursing shortage** *with over 1000 budgeted vacancies for registered professional nurses in hospitals alone. Yet over 5000 registered nurses are not practicing and there are unfilled places in most diploma and associate degree training programs.*

However, by 1980 the overall shortage of professional nurses will have markedly decreased, if: *(a) associate degree programs expand as planned and (b) future supply and effective economic demand for nurses follow expected trends.*

FIGURE 1–3

NURSES – SUPPLY AND DEMAND



Recommendation 1:

Existing associate degree programs should expand enrollment as rapidly as possible to the planned capacity. However, no new schools should be opened unless a real need can be demonstrated and availability of qualified faculty assured.

Recommendation 2:

Hospitals should continue their programs to make hospital nursing more attractive to the large reservoir of inactive nurses.

As the Hospital Council states: "Part of the manpower problem rests with hospitals. Unattractive working conditions, low pay, and rigid stratification, tend to make it difficult to get and keep personnel. Hospitals must correct these and at the same time use imagination and ingenuity in finding new and more efficient ways of utilizing their personnel".

Recommendation 3:

The Hospital Council of Maryland should implement its proposed program to recruit, retrain, and retain nurses. Refresher courses to re-recruit inactive nurses should be continued. State support is indicated.

Recommendation 4:

Diploma nursing schools and associate degree programs should provide high school students and their counsellors with accurate and current information about nursing programs and careers in nursing.

Recommendation 5:

No new diploma programs should be opened, but steps should be taken to ensure maintenance of current enrollment levels.

B. The demands for baccalaureate and masters level nurses will exceed the supply available in 1980.

Recommendation 6:

Additional collegiate facilities are needed. The Johns Hopkins School of Nursing, the only diploma school in Maryland associated with a university, should be encouraged to convert to a baccalaureate program. No additional collegiate schools should be opened without proof of need and evidence of availability of qualified faculty.

Recommendation 7:

Establishment of an additional graduate program should be considered as part of future planning.

C. Today there are 650 budgeted vacancies for licensed practical nurses in hospitals alone. Yet, 840 practical nurses are inactive, and practical nursing schools are not filled to capacity.

Recommendation 8:

Practical nursing schools should carry out more effective student recruitment.

Recommendation 9:

No new practical nursing schools should be considered until present schools are better utilized.

Recommendation 10:

Hospitals should expand their efforts to recruit inactive practical nurses.

Recommendation 11:

Hospitals should expand nurse-aide training programs.

D. Increasing needs for nursing services and rapidly rising costs of medical care require re-appraisal of quality and efficiency of nursing services.

Recommendation 12:

Experiments with new work patterns, for more effective utilization of nurse personnel should be made. These new work patterns should be part of prospective studies of patient care to determine the type of personnel best fitted for specific responsibilities.

Recommendation 13:

Studies should be conducted to determine the feasibility and practicability of having nurses with special training assure expanded patient care responsibilities such as pediatric nursing, nurse-midwifery, and geriatric nursing.

E. **Continuing evaluation of nurse manpower is necessary for effective planning.**

Recommendation 14:

Future health planning activities in Maryland should include nurse manpower planning.

Recommendation 15:

To facilitate future evaluation and planning, the State Board of Examiners of Nurses should have access to modern data processing facilities.

DENTAL MANPOWER

If current trends continue, by 1980 dentists in Maryland could provide for only 50 to 60 percent of predicted demand. Unless action is taken to alter present trends, the situation will grow worse after 1980. Actions of two types are indicated: 1. Increase absolute and proportionate number of dentists and, 2. increase dentist productivity.

Recommendation 1:

Build a second dental school in Maryland.

Recommendation 2:

Include full time use of auxiliaries in all clinical training programs of the University Dental School(s).

Recommendation 3:

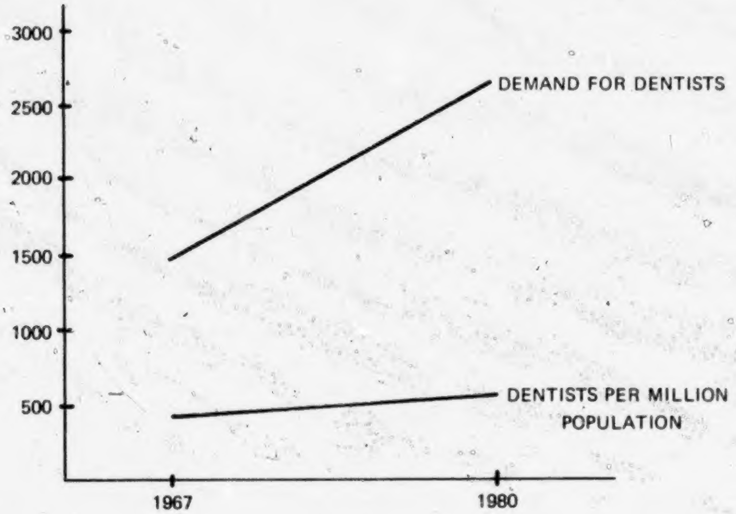
Increase the number of schools training dental auxiliaries.

Recommendation 4:

Modify Maryland Dental Law to permit a broadening of duties of auxiliaries.

FIGURE 1–4

PROJECTED SUPPLY AND DEMAND FOR MARYLAND DENTISTS



Comments:

When a new dental school is built, it should be located in a university as part of a health science complex. If the university site selected does not have a health sciences complex, one should be planned in conjunction with the dental school:

1. A health science complex would contribute to the general development and academic excellence of a university and would include necessary supporting disciplines for a medical school when the time comes to build one.

Action to increase dentists' use of auxiliaries must be indirect. The number of auxiliaries a dentist employs is his own choice. If dental students are trained to be completely dependent on auxiliary support while they are in school, they will make full use of auxiliaries following graduation.

Broadening the duties auxiliaries are allowed to perform is controversial. However, there is solid evidence that a number of duties now restricted to dentists can be performed by properly trained auxiliaries without sacrificing quality of treatment

ALLIED HEALTH PROFESSIONALS

A. **Data on the Allied Health Professions is of poor quality or non-existent.**

Recommendation 1:

A continuing survey and evaluation of allied health manpower should be carried out by an appropriate agency of the state.

Recommendation 2:

The state should improve licensing, registration and re-registration procedures for the allied health professions to provide data necessary for allied health professions educational planning.

B. **The severest shortage in 1980 will be medical laboratory technologists.**

Recommendation 3:

Present programs should be expanded to provide additional graduates or new programs should be initiated.

C. **Adequate information on the need for and utilization of environmental sanitation personnel in Maryland is not available.**

Recommendation 4:

Decisions on educational programs for environmental sanitation personnel should be deferred until the ongoing study on utilization of environmental sanitation personnel is completed.

D. **Physician productivity could be increased without sacrificing the quality of care through use of specially trained office assistants.**

Recommendation 5:

Appropriate curriculum should be developed and experimental training programs initiated to train physician assistants to assume appropriate work in doctor's offices, to permit more effective utilization of the doctor's time.

GENERAL CONCLUSIONS AND RECOMMENDATIONS

A. **Negroes are under-represented in the health professions in Maryland. This potential source of health manpower should be utilized.**

Recommendation 1:

All medical, dental, nursing, and allied health professional schools should make serious efforts to recruit qualified Negroes into the health professions.

More active recruitment is needed. The health industry has not been as aggressive in its search for Negro talent as other forms of industry. Representatives from the educational institutions must go where the Negroes are, must tell them that they are badly needed, and that stipends are available for qualified students.

B. **Health manpower planning should not be a sporadic, episodic effort but a continuing process.**

Recommendation 2:

A continuing review should be made of all types of health manpower in Maryland by an appropriate state agency. This agency might well be the new state Interagency Committee for Comprehensive Health Planning.

Recommendation 3:

Maryland's system of licensing and re-registration should be developed into a useful source of health manpower data for future planning.

All categories of health workers with over one year of academic training past high school should be registered. The present archaic systems of registration should be replaced by an automatic data processing system. Registration fees should cover the costs of the system.

Recommendation 4:

Health planning must be made a part of overall regional planning.

Perhaps the ineffectiveness of overall regional planning is the cause of the lack of economic development as well as health manpower shortages in certain regions of Maryland.

C. **There are definite economies of scale in combining medical, dental, and allied health professional schools in one setting.**

Recommendation 5:

Planning for the new dental school should consider future needs for a medical school and a school for the allied health professions.

D. **With the rapid changes in medical science, continuing education is essential for all health workers.**

Recommendation 6:

The "Medic" Network training programs should be expanded to include all health professionals.

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CHAPTER 2

PHYSICIAN MANPOWER

Introduction

Today, many people believe that there is a shortage of physicians in Maryland. Today, Maryland's physicians are unequally distributed within the state. By 1980, will the problems of physician manpower have disappeared, or become worse? Would changes now in the educational system avert future problems?

To answer these questions we have estimated the *demands* for doctor's *services* and the *supply* of doctors' to meet these demands in 1980. In making our projections we considered not only total population increases, but also the potential effects of changes in economic levels, age, racial composition, and levels of education. We translated the demand for physician services to numbers of physicians required, by applying projected rates of physician *productivity*.

$$\text{Population} \times \underset{\text{demanded}}{\text{services}} / \text{person} \div \underset{\text{provided}}{\text{services}} / \text{doctor} = \text{doctors demanded}$$

(For physicians not in patient care, we estimated increased demand from population increase, economic changes, increase in hospital beds, and past trends.)

To estimate the supply of physicians in 1980 we used two methods, 1) the annual increase from 1963-66 projected to 1980, and 2) the gains through new graduates and net in-migration of doctors, minus estimated losses by death and retirement.

We compared projected demand for physicians with the projected supply and found no concrete evidence of future major shortages. However, the balance is a precarious one, as we shall point out later. In the final step of our analysis of physician manpower we make recommendations for alternative methods of insuring balance between future demand and future supply of doctors.

DEMAND

By any measure, more of the services now rendered by doctors will be required in 1980. We have divided the services of physicians into three major groupings: 1) office services, which account for the largest expenditure of physicians' time, 2) administrative and teaching services, and 3) hospital services.

Administrative and teaching demands have grown much more rapidly than population over the past decade. We have used a conservative approach and projected demand on the basis of past trends rather than population increase alone. This may give a slight overestimate of demand.

For hospital services we have separated out full-time hospital physicians (interns, residents and others) and projected the demand for their services on a hospital bed increase basis.

There is no good recent data on the division of time between office and hospital for the large number of part-time hospital physicians, nor on the division of services between full-time and part-time hospital physicians. Although past data[1] showed that hospitalized patients accounted for less than 10 percent of all patients seen by non-hospital-based general practitioners and about 20 percent of all patients seen by specialists, these percentages may not prevail today. Therefore we projected the demand for private physicians on the basis of increases in office services and assumed that the increased demand for hospital services for their part-time hospital work would roughly parallel the increase in demand for their office services.

This is an approximation. Further studies should be made to measure the time division between office practice and hospital practice to permit more refined projection of demands for specific services. This further refinement would not appreciably affect the projection of total demand for physicians.

Since our projection for demands for services is based both on total population and composition of population, there will be differences from region to region that may not parallel the population growth within the region. Therefore, it is necessary to look at the population changes anticipated by 1980 within the state and within the regions of the state.

Population

The primary factor in increase of demands for medical services is the increase of total population. Table 2-1 gives the total population for Maryland, D.C., and major regions of the state by several alternative projections. These population projections were made by the U.S. Bureau of the Census, the Maryland National Capital Park and Planning Commission,[2] and by Mr. Arthur Benjamin, economist of the State Planning Office.[3] Both Maryland projections assume that birth rates and death rates will continue established trends for the next 15 years.

Projection A assumes that migration to Maryland occurs in response to predicted job opportunities and that in-migrant workers will bring dependents in the same proportion as prevailed in the past. Projection B is based on past rates of migration to Maryland. Table 2-1 shows the greatest difference between the two projections is in the metropolitan D.C. counties. We have taken the conservative approach and used Mr. Benjamin's projection A for all regions.

TABLE 2-1

1980 POPULATION OF MARYLAND (IN THOUSANDS)

U.S. Census (est.) 4,767	A	B	Maryland National Capital Park and Planning Commission	
Maryland	4,679	5,331		
Baltimore Region	2,508	2,717	D.C.	810
Western Maryland	332	306	Va. Co's	1,005
Montgomery & Prince Georges	1,400	1,830	Wash. SMA	3,251
Southern Maryland	145	155		
Eastern Shore & Cecil Co.	293	322	Balto. SMA	2,358

Baltimore Region = Baltimore City, Anne Arundel, Baltimore, Carroll, Harford, & Howard Counties

Baltimore SMA = As above, less Harford County
Western Maryland = Allegany, Frederick, Garrett, & Washington Counties

Southern Maryland = Calvert, Charles, St. Mary's Counties
Washington SMA = D.C., Montgomery, Prince Georges & the Virginia Co's (Arlington & Fairfax, including Alexandria, Falls Church & Fairfax)

Table 2-1 also shows that Bureau of the Census projections for total state population are close to the Maryland State Planning Department figures. Lest this reinforcement give rise to overconfidence in the accuracy of population projection, remember that in the late 1930's all experts agreed that the U.S. population would start to *decline* in the 1950's, the years of the "baby boom". The agreement of experts is no assurance that there will not be marked divergences from projected levels of population.

Economic Change

The next most important factor in change of demand for physician services is economic change. To predict economic changes we have used county data from Sales Management,[4] and National Planning Association projections,[5] combined with unofficial estimates from the state of Maryland. The importance of economic change is demonstrated by the fact that a person with family income less than \$4,000 averages 4.3 services per year while a person with family income over \$10,000 uses 5.1 services, almost a 20 percent increase. Furthermore, the over \$10,000 group will increase from 25 to 46 percent. Most of the economic improvement will occur in Prince Georges and Montgomery Counties and in Western Maryland.

Other Demographic Changes

Increases in the proportion of the population with college education, (only about 3 percent increase) will make little difference in the demands for medical services. Although persons with less than 9 years of education average less than 4.4 visits per capita per year while persons with a college education average 5.4 visits per year, the increase in percentage of college educated persons by 1980 would result in less than one percent increase in demand for doctors' services.

Although there are differences in rural (3.3 visits per capita per year, farm; 4.3 visits per capita per year, non-farm) and urban (4.8 visits per capita per year) rates of demand for physicians' services, these differences are not important, as the population shift from rural to urban will only be 3 percent. Furthermore, we use integrated regions with rates appropriate for each region.

In certain regions there will be some minor changes in the racial composition of the population which might cause some change in demand for physicians' services. These changes are not large, so we have ignored them.

Of course, we consider the basic racial, educational, and rural-urban composition of each region in calculating demand for service. Only large demographic changes will have appreciable effects on changes of overall demand per capita from 1963 to 1980.

The variables of education and race are closely correlated with economic level. By considering the variables independently we may have minor errors in estimation. To carry out a multiple variable analysis requires data not available in published figures of the National Health Survey and calls for statistical techniques that would render an already complex presentation almost incomprehensible.[6, 2]

We have attempted to include the special impacts of the Medicare Title 18 and Medicaid Title 19 program by assuming that persons in these groups will demand services at increased rates. In effect, all economic restrictions have been removed from their demand for medical services. However, we believe they will not demand medical services at the same rate as the richest groups. Their cultural and educational patterns will result in their using fewer services than the richest now use.

Services Demanded

For our primary source of data on office services rendered by physicians we have used the National Health Survey published information. The National Health Survey is one of the most used sources for health data in the United States. This survey, started in 1957, has collected information on rates of morbidity, hospital visits, physician visits, etc. It covers a sample of all persons in the civilian, non-institutional population in the United States. The sample is designed so interviews are conducted throughout the year. Data is collected on some 134,000 persons annually.

The term "physician visit" as used in the National Health Survey includes visits to the patient's home, to the physician's office, to a hospital or company clinic, as well as telephone consultations. Physician services on a mass basis, such as vaccination clinics, and visits to hospital in-patients are not included.

The National Health Survey has carried out several validity checks on the accuracy of their measurement of physician visits. The check from physicians' records indicated that some 70 percent of known visits to doctors were mentioned by the respondents at the time of interview. However, the National Health Survey rates are higher than rates reported by large comprehensive prepayment health insurance plans. These differences are not accounted for by age adjustment. However, the fact that one of the checks showed a lower rate than the National Health Survey, and the other check showed a higher rate suggests that the National Health Survey figures are reasonable.

The National Health Survey uses family income in determining economic level. This measure has certain problems inherent in its failure to recognize differences in family size.[7] However, it is a commonly used measure and is adequate for our purposes in projecting physician demand.

Although we base part of the increased demand for physician services in 1980 on economic development, it must be noted that in 1957 there were slightly more physician visits per capita than in 1963, despite rising economic levels in the United States. We believe, but have no concrete evidence to show, that this apparent decline was an artifact rather than a valid trend.

Since the National Health Survey does not present information by states or regions of states, we calculated rates for the Maryland regions. We used the percent Negro population, economic level, percent of rural population, and age distribution to fit national data to each region. For example, Southern Maryland's high percent of Negroes lowers its rate of demand; Montgomery and Prince Georges counties' high economic level increases their rate of demand above national levels.

Based on expected shifts of economic levels by 1980 we have modified rates of demand for services. Rates for 1967 and 1980 are presented in Table 2-2.

Demands for Teaching, Hospital, and Administrative Services

The demand for services of full-time hospital staff has grown from a base of 1,100 in Maryland in 1959 to 1,900 in early 1967. This 72 percent increase in demand over eight years tapered off to a 4.7 percent increase from 1966-1967. We predict that the rate of increase will continue to slow and that over the next 13 years the demand for hospital physician services will increase by about 50 percent. The 50 percent takes into account both increases in hospital beds and increased ratios of hospital physicians to hospital beds. Unfortunately, data are not available to break down the

TABLE 2-2

CALCULATED RATES OF DOCTOR VISITS PER CAPITA, 1967, 1980

	Western Maryland	Baltimore Region	Montgomery Prince Georges Counties	Southern Maryland	Eastern Shore
1967	4.4	5.1	5.4	3.7	4.0
1980	4.8	5.1	5.5	3.9	4.2

demand for hospital physician services to long term, psychiatric, children's, and general hospital demand.

The demand for physician services in teaching, research, and administration more than doubled from 1959 to 1963, but the rate of increase slowed markedly over the past 4 years. We predict that the demand for physician services in teaching, research and administration will increase by about 50 percent over the next 13 years. Opening a third medical school would obviously increase the demand for teachers.

The demand for federal physicians is not the responsibility of the State of Maryland. However, these job opportunities in Washington and Bethesda tend to attract physicians from hospital and private practice and diminish the supply available to meet Maryland's demand for medical services. We are not able to measure the effect of demand for federal physicians on the balance of manpower in Maryland.

PRODUCTIVITY

In determining productivity of physicians we calculated the current demand for physician services for the state and by the five major regions. (Services include telephone consultations and home and clinic visits as well as visits to the physicians' offices.) We divide this by the number of physicians in private practice in each region to develop a "synthetic" index of productivity. This index is synthetic as it does not take into account the differing extents of hospital practice from region to region. However, the spread in productivity from rural to urban region, shown in Table 2-3, reassured us that our synthetic index of productivity was relatively valid for comparative purposes. It paralleled data from two sources[8] which reported that urban doctors rendered from 5100-5700 services per year and rural doctors rendered from 6600-8200 services per year.

TABLE 2-3

VISITS PER DOCTOR PER YEAR

Western Maryland	Baltimore Region	Montgomery Prince Georges	Southern Maryland	Eastern Shore
5400	5400	5400	8000	5400

Comparing the earlier study to 1966 data indicates increases in productivity in rural areas and decreases in urban areas. We assume that the productivity of Maryland physicians will not change markedly by 1980.

It is well known that the productivity of physicians decreases with age. This decrease is shown quite clearly in Table 2-4. We have simplified our projections by ignoring the change in productivity from aging. This simplification is justified as the age distribution will not shift markedly in Maryland.

TABLE 2-4

PRODUCTIVITY BY AGE OF G.P.'s (Patients per year)

Ciocco (Md.)	-35	35-44	45-64	65+
	7300	8500	5500	3200
	-40	40-49	50-59	60+
NDTI (U.S.)	8500	8700	7600	6100

This estimation of productivity is one of the more uncertain parts of our projection as new technological developments may greatly change the practice of medicine. Organizational improvement adopted by large numbers of doctors could increase their productivity. Technological changes resulting in time-consuming, but beneficial, procedures would decrease productivity of doctors in terms of numbers of services rendered. Some technological changes might increase productivity.

By combining the factors of demand for services and productivity in terms of services per physician per year we can convert the demand for physicians' services into a demand for numbers of physicians.

FROM DEMANDS FOR SERVICE TO PHYSICIANS REQUIRED

Table 2-5 shows the number of private physicians required in 1980 by region. The increase in population, changes in composition of population, effects of Medicare Title 18 and 19, changes in economic level, and the productivity of physicians have all been considered.

TABLE 2-5

DEMAND FOR PATIENT-CARE DOCTORS
(excluding full-time hospital based)

	1980 pop. x	Visits/ capita ÷	Visits/ doctor =	Doctor demand
Baltimore Region	2,508,000	5.1	5400	2360
Western Maryland	332,000	4.8	5400	290
Montgomery Prince Georges	1,400,000	5.5	4500	1760
Southern Maryland	145,000	3.9	8000	70
Eastern Shore	294,000	4.2	5000	250
Maryland				4730
D.C. & Va. Cos.	1,815,000	5.4	4500	2210
MD-DC Area				6940

Projection of demand for services of hospital-based physicians reflects the projected increase in hospital beds[9] plus an estimate of increasing numbers of doctors employed per 1000 beds (35 percent). Currently there are almost 200 unfilled residencies and internships, about 10 percent of all hospital physicians. These are covered in the projected increases in demand.

The number of physician administrators, teachers and research workers demanded in 1980 is simply based on the increase in population plus a 25 percent correction as an estimate of increasing demand per capita.

The final table of this section (2-6), presents, by way of summary, the number of physicians that will be required in 1980 in Maryland and in the various regions of Maryland. The next section discusses the number of physicians who will be available to meet these demands, if present trends continue.

TABLE 2-6

DEMAND FOR PHYSICIANS, 1980

	Hospital Patient	Patient Care	Other	Total
Baltimore Region	2500	2360	740	5600
Western Maryland	25	290	—	320
Montgomery & Prince Georges	370	1760	140	2270
Southern Maryland	—	70	—	80
Eastern Shore	25	250	—	280
Maryland	2920	4730	900	8550
D.C. & Virginia Counties	1430	2210	620	4260
Maryland, D.C. area	4350	6940	1520	12810

SUPPLY

In the preceding sections we estimated the number of doctors' services required for 1980 and translated this demand for service into a demand for physicians. In this section, we estimate the number of doctors that will be available to serve the people of Maryland in 1980 if present trends continue. We base our predictions on two methods. The first is a modified cohort method using number of doctors currently in the Maryland area, less estimated losses by death and retirement, plus augmentation by new graduates from Maryland and D.C. schools, by in-migrants from other U.S. schools, and by foreign medical graduates.

All figures on the numbers and distribution of physicians in Maryland were obtained from a basic tape prepared by the American Medical

Association for use by the President's Commission on Health Manpower. Figures in most, but not all cases, will equal those presented in the two volume publication "Distribution of Physicians, Hospitals, and Hospital Beds in the United States, 1966".[10] Trends for the past three years were obtained from similar publications for 1963, 1964, and 1965.[11]

The differences between our figures and the published AMA figures are due to difference in definition of categories.

The American Medical Association records are an unusually good source for information for physician manpower supply. Their continuous revision of the list of physicians makes it more current than any other lists available in this country. Although the AMA has maintained this special list on locations, specialty, and professional activities since 1906, they have undertaken increasingly useful analyses of their physician records since 1958.

The only information that we felt was essential for our study, which was not available in AMA publications, was a detailed breakdown of physicians by age. We have been informed by the AMA that they plan to make this information available in the future, thus sparing future manpower appraisals in other states the problems and extensive delays inherent in use of computer analysis.

Exactly how do we define "doctor"? Since our basic data came from the American Medical Association records, we have included only graduates from schools of medicine. Unlike some studies, we have not included osteopaths in our calculation. This is justified as there are fewer than 50 osteopaths in Maryland and Washington.

There is some argument for including federal physicians in our calculations. The federal agencies concentrated in Washington and nearby Montgomery county may have a greater attraction for Maryland graduates and might even draw physicians away from practice in Maryland. However, we elected to exclude federal physicians in estimates of supply as our primary assignment was to estimate the demands for physicians in the Maryland area, not the entire United States. To include federal physicians would seriously bias our projections.

We made a separate projection of interns, residents, and full-time hospital staff (some 30 percent of the physicians in the Maryland area). They are rendering an appreciable percentage of the services demanded by the citizens of Maryland. Hospital-based, full-time physicians must be added to the total projection of supply.

We have excluded inactive physicians (5 percent of Maryland physicians) for obvious reasons.

We have included physicians in administrative research or teaching positions (10 percent of Maryland physicians) in a separate projection of supply.

Cohort Projection of Supply - Methodology

To make an estimate of retirement, death, and net migration changes for physicians now working in Maryland, we obtained an age breakdown of physicians in private practice in Maryland in 1959.[12] We obtained similar age breakdowns for 1967 from our AMA computer tape analysis. We then compared each age group from 1959 with the appropriate age group (i.e. 8 years older) from the 1967 data. The 1959, age 35-45 group, now aged 43-53 had gained less than 100 members, probably by in-migration, over the past 8 years. The 1959, age 45-55 and 55-65 groups to our surprise, had lost less than 100 members over 8 years. Since the changes are small and tend to balance one another we elected to ignore migration of doctors over 35, deaths, and retirements until age 65. We selected the age 65 as a median age of retirement realizing that some physicians will work beyond this age, but that the physicians who cut back on their practices before age 65 will balance the number that work beyond 65. Acquisition of more exact figures on the decline of producitivity with age and determination of the "effective age" of retirement of physicians would make a useful study. However, the more precise and more cumbersome calculation of change of productivity by age would not appreciably change our total figures for effective supply of physicians. We removed all doctors who would be over 65 by 1980 and moved in a new cohort of graduates and in-migrants. The age 25-35 cohort is not a "full" cohort. There are many doctors missing from Maryland who are fulfilling their draft obligations. Also, one whole year 25-26 is missing, as most doctors do not graduate until age 26. As we "aged" the 25-35 year old cohort by 13 years, we added 10 percent for the 25 year olds, and 8 percent, our calculated figure for returned doctor draftees.

The group moving into the new 25-35 year cohort of 1980 will still be missing 25 year olds and draftees, but they will be augmented by Maryland's share of the increased number of medical graduates. The American Association of Medical Colleges estimates that graduates will increase by 14 percent by 1970 and 23 percent by 1975.[13] Therefore we have augmented Maryland's 25-35 group for 1980 by an average of 16 percent.

The result of all these machinations is a projection of *7900 non-federal physicians* for the State of Maryland. This figure does not include estimates of the rapidly increasing numbers of foreign graduates coming to Maryland. We discuss this problem later.

The cohort method may be suitable for Maryland, or the Maryland-D.C. area, but it is not suited for smaller regions. For this purpose we use a prediction based on the net increase for most recent 3 years of record.

Rate of Increase

We simply calculated the average *net* increase for three categories of physicians, and for the five regions of Maryland and multiplied these rates by the thirteen years until 1980. We then added the expected net increases to the present numbers of physicians in the various categories. Implicit in this method is the assumption that present rates of graduation, retirement, and migration remain constant. This method includes the rapid increase in foreign graduates and thus gives a larger total, 8400, for Maryland physicians in 1980. Detailed results are presented in Table 2-7.

TABLE 2-7

SUPPLY OF PHYSICIANS, 1980

	Hospital based	Patient care	Teaching Admin. & Research	Total[2]	Total (cohort method)
Baltimore Region	2760[1]	2110	1030	5900	5660
Western Maryland	40	290	10	340	[3]
Montgomery Prince Georges	390	1460	190	2040	[3]
Southern Maryland	—	40	—	40	[3]
Eastern Shore	40	260	10	310	[3]
Maryland total[2]	3230	4160	1240	8630	7930
D.C. & Va. counties	1370	2880	580	4830	
Md.-D.C. area - total[2]	4600	7040	1820	13460	12050

[1] Increase rate for 1956-66 used in place of three year average as rate of increase is declining.

[2] Totals added, not calculated from total increase rates. Totals thus reflect correction for Baltimore projection.

[3] Cohort method not applicable for regions with small numbers of internships and residencies. Western Maryland and Eastern Shore show 50 percent deficits in the less than 35 age group indicating worsening shortages.

We close with the warning that these projections are based on historical data. This presupposes that changes of the next thirteen years will be similar to those over the past ten years. This is an oversimplification. However, the graduates of the next four years are already in medical school. The medical school expansion that could significantly affect graduates over the next decade has already commenced. The physicians already practicing in Maryland will retire at predictable rates. Thus, the 'inertia" of physician supply lends stability to our projection for 1980.

PAST TRAINING OF MARYLAND PHYSICIANS

The first step in exploring methods of increasing physician supply in Maryland is to determine the place of training of physicians now practicing in Maryland, particularly recent graduates. As one might expect, the University of Maryland trained more Maryland physicians than any other school. We were surprised, however, to find that University of Maryland graduates (1,390) made up less than 20 percent of the total of non-federal physicians practicing in the Maryland-D.C. area. Johns Hopkins is the next most important contributor, with just under 10 percent of Maryland-D.C. graduates. The District of Columbia schools (Georgetown, George Washington, and Howard) make up another 10 percent. The rest of the medical schools in the United States contribute 30 percent and, quite surprisingly, foreign medical graduates make up the remaining 30 percent. We shall return to this point of Maryland's dependence on foreign medical graduates in a subsequent section.

How many doctors remain in the state after graduating from Maryland medical colleges? We were not surprised to find that less than 15 percent of Hopkins graduates practice in Maryland (correcting the graduates of the past ten years who are in internships and residencies in Maryland). We were surprised to find that, except for the most recent decade, less than one-third of the University of Maryland graduates remain in the Maryland-D.C. area. Fortunately, the percentage of retention of graduates from both Maryland schools is increasing.

In the Washington schools, Georgetown, George Washington, and Howard, there is also a trend for increasing percentages of graduates to remain in the Maryland-D.C. area. For all schools, except in the last decade, less than 25 percent of the graduates take up practice in the Maryland-D.C. area.

Comparable figures for all schools in the United States show that roughly half of the graduates take up practice in the same state where their medical school is located.

The implications of these findings are: 1) less than 30 percent of graduates from any expanded training facilities could be expected to remain in Maryland, 2) efforts should be made to persuade more Maryland graduates to remain in Maryland.

COSTS OF MEDICAL EDUCATION

The problem in accurately determining and apportioning the various costs that go into the training of a doctor is a difficult and controversial subject.[14] However, recent experience with the construction of 16 new medical schools in the United States indicates that the capital development costs alone for a school without existing facilities would be over *35 million dollars.*[13] Additional funds would be required if a dental school or school of allied health services is to be built in conjunction with the medical school. Half a million dollars per first year M.D. candidate position is required for construction and initial development. Several consultants with experience in developing new schools said that these figures are too conservative as they do not take into account the marked increases in construction costs.

With expenditures of this magnitude, obviously the expansion of the medical schools or construction of new medical schools should not be entered into lightly. The study, Developing Medical Schools: An Interim Report by Dr. C. M. Smythe in the November Journal of Medical Education should be studied carefully by groups considering expansion of medical education facilities within Maryland.

Planning of New Medical Schools

There are no universally satisfactory standard designs or site plans for new medical schools. Since this study did not include medical school planning only a few broad guidelines are mentioned.

Clearly the most important consideration is the location of a new school or health center. It must be a functional and physical part of a university. Medical education can no longer be accomplished in an isolated professional school. The modern school has deep roots in the humanities and social sciences as well as in the physical sciences. Only universities encompass all the fields and disciplines related to health and only in universities can research, instruction and service be effectively integrated.[15]

The next essential element is the possession of a university owned or, at least, controlled hospital. More than seventy-five percent of all U.S. medical schools own their own teaching hospitals. All constructed in the past two decades either have or have definitive plans for such an affiliation.

The amount of space required varies greatly but most institutions built in the past two decades have used approximately 30 acres. This space contemplates a health center complex, which should be the objective of any organization planning for a new school. Only in a few special instances have any large urban centers found such space. The cost of expansion and alterations of existing institutions in the crowded city is inordinate.

The most important guideline in planning for a new medical school is to allow sufficient time for careful detailed planning before action is taken.

DISTRIBUTION OF PHYSICIANS

The section on Supply and Demand 1980, points up the unequal distribution of physicians within the regions of Maryland. This unequal distribution is not peculiar to the State of Maryland nor to the United States. It is a universal phenomenon that the resources of civilization tend to concentrate in areas of high population density.

If Southern Maryland has less access to physicians than other areas in the state, it also has less access to banks, stores, colleges, airports, etc. Rural areas are, and always will be, less well staffed with physicians, on a per capita basis, than the urban areas. Recommendations that may ameliorate the distribution problem are given in the Conclusions Section.

FOREIGN MEDICAL GRADUATES

We have already alluded to Maryland's problem of dependence on foreign medical graduates to meet physician manpower needs. Maryland receives 10 percent of all foreign medical graduates, and has less than 2 percent of U.S. population. To clarify the problem, we present detailed information on foreign medical graduates in Maryland.

Large scale migration of foreign physicians to the United States is a relatively recent phenomenon. In 1950 only 308 of the new licensees in the U.S. were foreign medical graduates. Table 2-8 shows the number of foreign medical graduates added to the medical profession in Maryland, the District of Columbia, and the United States for selected years since 1950. It indicates Maryland's increasing dependence upon foreign physicians

TABLE 2-8

FOREIGN TRAINED PHYSICIANS ADDED TO MARYLAND, DISTRICT OF COLUMBIA, AND THE UNITED STATES

	Maryland	D.C.	U.S.
1950	9	2	308
1955	33	8	907
1960	48	29	1419
1964	93	58	1306
1965	67	54	1488
1966	130	32	1410

Twenty-one percent of all physicians in Maryland are foreign graduates, compared to twelve percent in the nation. Table 2-9 shows the distribution of foreign doctors in Maryland.

TABLE 2-9

FOREIGN TRAINED PHYSICIANS IN MARYLAND BY REGION AND TYPE OF PRACTICE (Including House Staff)

	Baltimore Region	Western Maryland	Montgomery Prince Georges	Southern Maryland	Eastern Shore
G.P.	81	7	22	5	17
Med. Spec.	197	5	46	2	3
Surg. Spec.	338	10	61	5	9
Other Spec.	282	5	71	1	22

In 1950, nine percent of all residents in United States hospitals were foreign trained. By 1966 the number had increased to twenty-four percent. The increase is even more impressive in view of the introduction of certifying exams which had a limiting influence on the flow. By 1965, 368 or 38 percent of Maryland's residency positions were filled by foreign graduates. Ninety foreign graduates represented 29 percent of internship positions filled.

Several countries in the traditional group of "major suppliers" of physicians to the U.S. are contemplating, or have recently passed, laws intended to drastically reduce their outflow of physicians to this country. Although such laws may not have their greatest impact for several years, it seems unlikely that present output of U.S. schools will be able to compensate adequately. In the United States, approximately 12 medical schools would be required to train the number of doctors now gained through physician migration. Maryland would need two more medical schools to replace their share of foreign medical graduates.

The dilemma is one of providing the opportunity for post-graduate specialty training for physicians from other countries without becoming dependent upon these physicians for provision of medical services.

In summary, Maryland is dependent, too dependent, on other countries for their physician manpower. For three reasons we should attempt to decrease our dependence on a foreign medical graduate. *First,* it is unjust for the United States, the richest country in the world, to lure physicians away from the poor and the under-developed nations of the world. *Second,* the State of Maryland must assure its people that the foreign medical graduate offers care that is in every sense equal tc care offered by U.S. trained physicians. *Third,* we are in a precarious position by depending so heavily on foreign medical graduates. If half a dozen countries erect barriers to physician migration, Maryland would be placed in a difficult position. The implications of this problem are presented in our conclusions.

SUPPLY AND DEMAND 1980

The keystone to any manpower study is the comparison of projected supply with projected demand. All recommendations depend on this critical comparison. For physicians in Maryland our comparison shows no clear-cut mandate. We do not face an inescapable outcome of rapidly worsening shortages unless immediate action is taken, as in the case of dentists. Nor do we have a clear-cut case for not considering a new medical school, as was the case in the 1962 report on Medical Education in Maryland. What we have is a prediction that, using the most stable projection method, supply will fall slightly short of demand in Maryland and in the Maryland-D.C. area in 1980. This conclusion calls more for planning than for immediate action. Viewing the state as a whole, there is no immediate crisis in physician manpower. Health planners in the state have time to reflect on the type of physician training, and how this physician training could be linked to increased productivity. Maryland is a rich state, but not so rich that we can afford profligate use of physicians' time. The physician is the most expensive member of the health team. How can his services be extended by more extensive use of ancillary personnel? by group practice? by other systems to improve efficiency?

If physicians are to use ancillary health workers effectively, they should be trained to use them while they are in medical school. If a new and more productive doctor is to be prepared, much time and thought must go into the planning of his medical education. Maryland has the opportunity for this type of planning.

Our comparison of projected supply and demand for 1980 shows that Southern Maryland's shortage of physicians may grow steadily worse while conditions in the Eastern Shore and Western Maryland may remain stationary.

The potential slight shortage of physicians by 1980 will probably be concentrated in private practice. General practice will follow its present declining course, as the younger age group has a smaller percentage of G.P.'s than of any of the specialties.

CONCLUSIONS AND RECOMMENDATIONS

A. **If current trends continue, there will be a moderate shortage of physicians in Maryland in 1980.**

Recommendation 1:

Planning should be started now for a third medical school in Maryland, not a crash effort for a new school in 1975, but rather deliberate consideration and planning.

There are great problems in securing sound financing for both capital development and long-term operating budget, selection of a site (at least three sites have been proposed during the four months of our study), and in selecting the type of school. Good will and interest are poor substitutes for adequate capital development funds and assured income. We have seen no evidence of the latter in Maryland. Communities now clamoring for a medical school should recognize that it is a terribly expensive undertaking.

There are definite economies in delay, for the medical school which is started in 1980 will be very different from the school started in 1970. Deliberate delay will save the costs of rebuilding or remodeling a school constructed too soon.

Recommendation 2:

Adequate support for existing medical schools must be assured before a new medical school is contemplated.

B. Maryland's dependence on foreign medical graduates must be reduced.

Recommendation 3:

Long range planning (beyond 1980) should not count on large numbers of foreign medical graduates.

Recommendation 4:

Maryland hospital boards should answer the question: Does our hospital accept foreign house staff primarily to educate them, or to provide a source of cheap labor.

Recommendation 5:

State licensing examinations should *ensure* that foreign medical graduates are in every way equal in quality to American graduates.

C. The distribution of physicians within the State of Maryland is inequitable.

Recommendation 6:

Regional health planning groups with "consumer" representation should be set up in the rural regions of Maryland to consider recruitment of physicians for specific areas.

Recommendation 7:

Programs of scholarship aid in return for agreement to practice in rural areas should be considered, even though these programs were not outstandingly successful in the past.

Recommendation 8:

Medical schools should continue their teaching and service programs in the outlying parts of the state.

Obviously, every village and hamlet in rural Maryland will not have a physician. If the consumers of medical care in the rural regions of Maryland are truly concerned with the shortage of physicians, they should find some way to make practice in the rural areas financially and professionally more attractive.

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CHAPTER 3

NURSE MANPOWER

Introduction

Today, there are 1,000 unfilled positions for registered nurses budgeted for the hospitals of Maryland. Will there be more, or fewer unfilled nursing jobs in 1980 if present trends continue?

Paradoxically, there are now over 5,000 registered nurses in Maryland who are not working. Perhaps there is not so much a shortage of nurses, as a shortage of money to pay enough to attract adequate numbers of nurses to the labor force. Perhaps, however, nursing as a female occupation is not fully responsive to increased salaries and better working conditions. Preparation for nursing does not necessarily result in a commitment to the professional activity. What will be the effects of Medicare, Medicaid, growing population, and rising economy on demand for nurses? What will be the effects of the new Associate in Arts training programs and the growing collegiate programs on nurse supply?

These problems are central to effective nurse manpower planning. Their effects on nurse supply and demand for nurses in 1980 follow. In Conclusions and Recommendations, we offer alternative solutions to help prevent potential problems in the 1980's.

CURRENT SUPPLY

Sources of Data

Information was obtained from agencies which compile data on nursing personnel. Such data describe the past and present nurse population and provide a baseline for determining future supply, and to a lesser degree, future demand. The Maryland Board of Nurse Examiners, the Hospital Council of Maryland, the American Nurses' Association (ANA), and the Divisions of Nursing and of Public Health Methods of the United States Public Health Service, Department of Health, Education, and Welfare were our primary sources of information.

We obtained additional data in a survey carried out with the cooperation of the Schools of Nursing in Maryland. An unpublished survey of Nursing Needs and Resources in Maryland, by the Planning Council for the Maryland Board of Health and Mental Hygiene was also a source of information.

Enumeration data and characteristics of nurse supply are collected for Maryland through the licensing procedure of the State Board of Nursing, licensing body for professional and practical nurses. The data are incorporated in the national inventories of nurse supply conducted in 1949, 1957, 1962 and again in 1966 by the ANA and the PHS.

Total Supply

There were an estimated 15,000 registered professional nurses in Maryland in 1966; 9,800 (65 percent) were actively employed; 5,000 (35 percent) were inactive. For comparison, in 1949, 20 percent of nurses were inactive. In addition to registered, inactive nurses, there are probably as many inactive nurses in Maryland who are not registered. Nurses who are unwilling even to keep up their registration are not really a potential source of Nurse Manpower.

The ratios of population to active professional nurses in Maryland and the United States for 1949, 1962 and 1966 are shown in the following table.

TABLE 3-1

POPULATION PER NURSE

Year	Maryland	United States
1949	502	494
1962	416	345
1966	378	311

It is quite clear that Maryland has not participated fully in the nation's increase of nurses. The growth of the U.S. supply of nurses has exceeded population increase by 59 percent in 17 years while Maryland's increase is only 30 percent. It is not clear why Maryland's nurse supply has not kept pace with the nation.

In addition to registered professional nurses there are over 12,000 nursing aides, orderlies, and licensed practical nurses working in Maryland. There are one thousand LPN's who are inactive. Data on the sub-professional nursing auxiliaries are scarce and of dubious quality.

Characteristics and Distribution

Table 3-2 presents the basic educational preparation of active professional nurses in Maryland from the 1966 ANA inventory. Although diploma graduates are still the most numerous, the proportion has decreased in the past four years.

The distribution of active, registered professional nurses in Maryland by region is shown in Table 3-3.

Not unexpectedly there are more people per nurse in the rural regions of Western Maryland, Southern Maryland and the Eastern Shore than in urban Baltimore and the D.C. counties.

TABLE 3-2

HIGHEST EDUCATIONAL PREPARATION OF NURSES ACTIVELY EMPLOYED IN MARYLAND, 1966[1]

Educational Level	Number	Per Cent
Diploma	7823	79.5
Baccalaureate	1229	12.5
Associate Degree	101	1.0
Masters	415	4.2
Doctorate	21	0.2
Unknown	251	2.5
Total	9840	99.9

TABLE 3-3

RATIOS OF POPULATION TO ACTIVE REGISTERED PROFESSIONAL NURSES BY REGION, 1962

Region	Population	Number of Nurses	Ratio
Baltimore	1,870,000	4,361	408
Western Maryland	273,000	828	330
"D.C. counties"	784,000	1,385	567*
Southern Maryland	93,000	100	930
Eastern Shore	249,000	556	448

*The "D.C. counties" are part of Washington SMA which has 290 people per nurse.

Table 3-4 shows that there are almost as many registered nurses in the 30-40 year group as in the 30 year group, a distribution consistent with that for all females in Maryland.

The age pattern of inactive nurses shows a slight effect of biphasic working pattern of females. (Lower proportions of nurses are inactive under age 30 and over 40, reflecting patterns of working before having children and after children enter school.)

Table 3-5 presents the number and proportion of active registered nurses by field of practice in Maryland for the years 1949, 1957, and 1966. Some 60

TABLE 3-4

AGE OF NURSES EMPLOYED IN MARYLAND, 1966[2]

Age	Number	Percent
Under 30	2854	29.0
30-39	2225	23.0
40-49	2253	23.0
50-59	1715	17.0
60 and over	620	6.0
Unknown	173	2.0
Total	9840	100.0

TABLE 3-5

ACTIVE REGISTERED PROFESSIONAL NURSES BY FIELD OF PRACTICE, MARYLAND, 1949, 1957, 1966

Field	1949		1957		1966	
	No.	%	No.	%	No.	%
Hospital	2304	50.3	4710	62.5	6315	64.2
Public Health	572	12.5	707	9.4	1094	11.1
Occupational	110	2.4	208	2.7	302	3.1
Nursing Education	275	6.0	319	4.2	408	4.1
Private Duty	1017	22.2	1282	17.0	995	10.1
Office	156	3.4	220	2.9	597	6.1
Other and Unknown	146	3.2	92	1.2	129	1.3
Total	4580	100.0	7538	99.9	9840	100.0

percent of active registered nurses in Maryland were employed by hospitals in 1957 and 1966 as compared with 50 percent in 1949. Private duty nursing has markedly decreased since 1949. Industrial and office nurses have increased in numbers and percentages, but still total less than 10 percent of all nurses. Public Health nurses have increased in number but have declined as a proportion of all nurses since 1949.

Nurses in Hospitals

Hospitals employ some 380,000 professional nurses, more than two-thirds of all employed professional nurses in this country. American Hospital Association figures for 1965 show that a quarter of hospital nurses were employed in part-time positions. The growth of part-time nursing has accounted for a large proportion of the increase in hospital employment of professional nurses in recent years.[4]

A 1966 survey of hospitals by the USPHS Division of Nursing and the American Hospital Association estimated, from incomplete returns, that 6,767 professional nurses and 2,852 licensed practical nurses and almost 10,000 nursing aides, orderlies and attendants (including part-time personnel) are actually employed in Maryland hospitals.[5] Thus over half of the personnel engaged in hospital nursing service are relatively unskilled, prepared through on-the-job training or short inservice educational programs.

In 1966 the Hospital Council of Maryland also conducted a survey of manpower in Maryland hospitals.[6] The results were different from those of the PHS-AHA survey as: 1) they did not count all part-time workers, but used full-time equivalents, and 2) they had more replies and possibly greater accuracy. However, they also found the most critical shortage was in nursing personnel at all levels. They reported 1000 budgeted vacancies for registered nurses and 650 budgeted vacancies for LPN's in Maryland hospitals. A compromise between the studies gives 6,000 part-time and full-time professional nurses and 2,600 part-time and full-time LPN's now working in Maryland hospitals. A rough estimate, based on a small sample, indicates that 600 professional nurses, 600 LPN's, and 3,000 aides and orderlies may be working in extended care facilities in Maryland.

Public Health Nursing

Table 3-6 presents the numbers of public health nurses employed by 41 agencies in Maryland, January, 1967. A total of 985 full-time equivalent nurses gives a ratio of 3,670 people per nurse. Local and state official health agencies employed 88 percent, voluntary agencies 4 percent, and boards of education 8 percent. Approximately one-third of nurses employed for public health work in Maryland have completed an approved educational program for public health nursing. Of these, 28 percent held a baccalaureate or higher degree.[7, 8]

Nursing Auxiliaries

In 1962 there were 3,261 practical nurses licensed in the State of Maryland of whom 2,421 were actively employed and 840 were inactive. Almost one-half of active licensed practical nurses were employed in general hospitals, 17 percent in psychiatric hospitals, 13 percent in specialty hospitals, and 20 percent in nursing homes, as private duty nurses, or in public health agencies, industry and physicians' offices.

TABLE 3-6

PRELIMINARY REPORT–NUMBER OF PUBLIC HEALTH NURSES EMPLOYED IN 41 AGENCIES IN MARYLAND, JANUARY 1, 1967

Agency	Public Health Nurses		Licensed Practical Nurses
	Total No. Full-Time	Total No. Part-Time	Full-Time
Maryland State Department of Health	20		
Local Health Departments			
Baltimore City Health Dept.	259	24	--
23 Counties	499	118	1
Instructive Visiting Nurse Association	32	3	10
Boards of Education	94	15	
Total	905	106	11

By 1966 the PHS-AHA Survey estimated 2,900 LPN's were working in Maryland hospitals (assuming 20 percent outside of hospitals gives a total of 3,500 LPN's).[9] In addition there were 360 surgical aides and 9,700 nursing aides, orderlies and attendants, making a total of some 13,000 nursing auxiliaries in the hospitals of Maryland. The total is important in itself as well as having implications for the numbers of supervising nurses needed.

NURSING EDUCATION

There are three types of nursing schools today: 1) The hospital school, granting a diploma, 2) the two-year community college, granting an associate degree, and 3) the college or university, granting a baccalaureate degree.

The traditional hospital program is usually three years in length. The majority of collegiate programs are four academic years in length; a minority of schools offer five-year programs.

The associate degree, community college, programs in nursing were initiated in 1950 in the United States. They have grown rapidly to a total of 218 programs in 1966. The first program of this kind was inaugurated in Maryland in 1965. Seven others have opened during the past 2 years.

There are at the present time in the United States 1,225 schools of nursing of which approximately two-thirds are located in hospitals and the remaining one-third in community colleges and universities. The following table presents the proportion of professional nurses practicing in the United States according to educational level of preparation for the selected years 1952-2964.

TABLE 3-7

CHANGES IN NURSING EDUCATION IN UNITED STATES[10]

	Masters or Doctoral %	Baccalaureate %	Diploma or Associate %
1952	1.0	7.2	91.8
1960	1.7	7.4	90.0
1964	2.3	9.0	88.7

The various educational programs offered in nursing have led to confusion and misunderstanding about the necessary and desirable preparation required for students to study the practice of nursing. The same state board examination is offered to graduates of the three types of programs. Many institutions offer no differential salary scale to the new graduate. If society pays more to train baccalaureate nurses, then their value should be reflected in higher salaries. Even more complex is the question, what expectations should the employer of the graduate nurse have for differences in type of practice according to the educational level of preparation? These issues are important in understanding the problems in predicting future trends in nurse manpower.

At the present time there are in Maryland three collegiate schools of nursing, 17 hospital (diploma) and eight associate degree programs. Only one university school offers a program for graduate (masters level) education. The development of the two-year educational programs began in 1965 in the community colleges of the state and therefore have not yet had an opportunity to contribute to the population of nurses in Maryland. However, it is expected that the rapid growth in number of such programs will markedly influence the numbers of nursing personnel available. Two hospital diploma schools are presently closing to convert to two-year associate degree programs.

Diploma schools in Maryland do not operate at full capacity. Our survey showed that 160 more students could have been admitted in 1966.

Table 3-8 shows the number of admissions to schools of nursing for the selected years 1960, 1963 and 1966. The proportion of admissions to diploma schools decreased from approximately 83 percent of total admissions to Maryland Schools of Nursing in 1960 to 60 percent six years later, while baccalaureate program admissions increased from 17 percent to 31 percent. The new two-year programs increased to 9 percent of total admissions in 1966.

Table 3-9 presents the number of graduates for selected years. The increase in baccalaureate nurses and the lack of increase in diploma nurses is clearly shown. The full effect of associate degree programs will not be seen until 1970 or later.

TABLE 3-8

NUMBER AND PROPORTION OF ADMISSIONS TO SCHOOLS OF NURSING, MARYLAND, 1960, 1963, 1966, BY TYPE OF PROGRAM[11]

Type of Program	1960		1963		1966	
	No.	%	No.	%	No.	%
Baccalaureate	153	17.2	222	21.2	355	31.0
Diploma	736	82.8	823	78.9	682	59.7
Associate Degree	0	0	0	0	106*	9.3
Total	889	100.0	1045	99.9	1143	100.0

*Four schools only.

TABLE 3-9

NUMBER GRADUATES FROM SCHOOLS OF NURSING, MARYLAND, 1960, 1963, 1966, 1967, BY TYPE OF PROGRAM[11]

Type of Program	1960 No.	1963 No.	1966 No.	1967 No.
Baccalaureate	130	125	159	195
Diploma	473	604	514	518
Associate Degree	0			30
Total	603	729	673	743

In 1964 there were 2,860 students enrolled in Maryland schools of nursing as compared with 2,184 in 1957.

The university schools are accredited by the National League for Nursing. Of the 17 diploma schools 13 are accredited by the national organization.

Hospital schools of nursing in Maryland vary widely in their capacity to accept students. Three schools have a capacity of less than 30, eleven of 30-60 students, and three of over 60. The eight newly established associate degree programs range in capacity from 15-42 students. Two of the university schools reported a capacity of approximately 50 while the third indicated a limitation to 121.

In 1966, all of the 123 faculty members of the three university programs for Maryland held academic degrees, 85 percent of which were earned at the graduate level. Of the 19 faculty members in community colleges, two held baccalaureate degrees and the remainder master's degrees. In diploma schools, 71 percent of 289 faculty were graduates of baccalaureate or higher degree programs while 29 percent were prepared in diploma schools. In 1964 the student-teacher ratio was one to ten. Of the 28 schools, 14 reported needs for one to five additional faculty, a total of 36 unfilled positions.

Graduate Education

The University of Maryland School of Nursing has the only graduate program in the state. Catholic University in Washington, D.C., is the only other graduate institution in the vicinity.

In 1966, 90 full-time students were enrolled in the masters program of the University of Maryland. In 1967, 72 new students were admitted to the six specialty masters programs. During the period 1956-1965, a total of 231 students were graduated from the masters program. Of these, 105, almost one half, remained and were employed in the state. Of the total, 127 held positions in the field of nursing education, 87 in nursing service; only 17 were unemployed. In 1967, because of limitations in capacity for students and in numbers of faculty, some applicants to the graduate program could not be admitted.

The University of Maryland School of Nursing is in a strategic position to undertake exploration of ways and means through which nurses might be encouraged to plan for doctoral study. The School of Nursing definitely is not ready to begin planning for a doctoral program until there are more faculty members with doctoral preparation.

The Registered Nurse Program

It is important that a state supported school of nursing provide the opportunity for diploma graduates to earn a degree. Historically a number of diploma nurses have progressed to graduate education and leadership positions. A "bridge" over which the qualified R.N. may travel to earn a baccalaureate degree must be kept open.

Auxiliary Nurse Education

Vocational nursing personnel should be prepared in programs which are a part of a system of vocational education. The nursing profession, however, has responsibility for enunciating standards. Such programs must be closely affiliated with hospitals and other health agencies. Nurses aides or auxiliaries, unlike practical nurses, have been largely prepared through on-the-job training. The nursing profession advocates that preparation of assistants in the health service occupations be short, include intensive preservice programs in vocational education institutions, and adaptation to the job in an individual hospital or health agency through in-service education.

There are at the present time 23 schools of practical nursing in Maryland located in 18 institutions in the state. Only two of the programs are accredited by the NLN. Nine of the schools are presently financed through federal funds under the Manpower Training Act.

All of the schools of practical nursing in Maryland offer one-year programs. The minimum educational requirement for entrance is completion of the tenth grade, the maximum, graduation from high school. The schools, in general, are not filled to capacity, although employment opportunities for licensed practical nurses are numerous in hospitals and nursing homes. It seems apparent that the problem of recruitment will become more severe as admissions to the two-year community college programs increase.

Less than two-thirds of the faculty in schools of practical nursing have a baccalaureate or higher degree.

Table 3-10 shows the enrollment, admissions to and graduations from schools of practical nursing in Maryland for the years 1951, 1962, 1964 and 1967.

TABLE 3-10

STUDENT ENROLLMENT, ADMISSIONS TO AND GRADUATIONS FROM SCHOOLS OF PRACTICAL NURSING IN MARYLAND FOR THE YEARS 1951, 1962, 1964, AND 1967

	1951	1962	1964	1967
Number of Schools	8	10	14	23
Enrolled	185	291	444	--
Admitted	224	314	433	568
Graduated	150	222	259	--

Continuing Education

A state-wide coordinated program to help return inactive nurses to nursing was instituted by the Hospital Council of Maryland in conjunction with the Maryland Nurses Association and the Maryland League for Nursing in April, 1966.

Approximately 345 inactive nurses have enrolled in these programs. The average age has been 43. Most students have been inactive from 6 to 20 years. The dropout rate experienced thus far is less than 3 percent; approximately 335 completed the course.

A follow-up of 222 who completed the first series of courses shows that 60 percent have returned to work (103 part-time and 30 full-time).

The areas of Maryland offering courses thus far are: Western Maryland, the D.C. area, the Eastern Shore, and Metropolitan Baltimore. Plans are under way for new programs in three health agencies in Southern Maryland and one in the northern section of Maryland.

The objective of the R.N. Refresher Program in Maryland is to return nurses to active nursing wherever they are needed—not only in hospitals, but also in extended care facilities, public health agencies and other agencies which need the services of nurses. Therefore, enrollment in the programs involves no commitment on the part of the participant to seek employment in the agency conducting the program, as well as no commitment on the part of the conducting agency to hire the participant. Maryland hospitals have been most willing to agree to this stipulation, as they are aware of Maryland's *increasing* nursing needs caused by expanding comprehensive community health services.

COSTS OF NURSING EDUCATION

Costs of nursing education should not be confused with nursing school *tuition*. Costs are usually much greater, are calculated, rather than set by decree, and are vital for health manpower planning. Costs are important determinants for decisions to open, close, or convert schools of nursing. Tuition charges are important in determining the economic background of the students and the numbers of potential applicants in the various programs.

Information on costs comes from two five-year studies by the National League for Nursing.[13] The studies covered 126 diploma programs, 10 associate degree programs, and 21 baccalaureate programs, which are representative of the United States. These four-year-old costs should be increased at least 10 percent to approximate 1967 costs.

Some three-year diploma programs were more expensive than four-year baccalaureate programs, some two-year associate in arts programs were more expensive than three-year diploma programs. Despite the few programs that were "out of line" in terms of costs, there was enough stability in costs to permit comparison of the major types of programs. The median cost for graduation per student was about $3,000 in the associate degree programs, about $5,000 in the diploma scheme (*after the value of student's services had been deducted*) and about $6,000 in baccalaureate programs.

In addition to direct costs of nursing education there are indirect costs of productivity lost when a girl studies nursing rather than working after high school. We add $3,000 per year to the cost of the training program to calculate the over-all costs of nursing education to society. The total cost per nurse graduated is $9,000 for the associate in arts program, $14,000 for the diploma program, and $18,000 for the baccalaureate program.

The *value* society places on graduates from these programs may be equated to average lifetime earnings, discounted and corrected for non-working nurses. Although starting salaries for all types of staff nurses are often the same, the better chances for advancement of baccalaureate nurses may give them greater lifetime earnings.

The implications we draw are: 1) If the associate in arts degree is indeed the equivalent or superior to diploma training, as its proponents claim, it is more economical for society; 2) if the baccalaureate program in nursing produces a superior nurse to serve the needs of society, the additional costs over training diploma nurses is really not excessive.

Tuition for Nursing Schools in Maryland

The total tuition costs for the complete training program of students enrolled in the 17 diploma schools in Maryland during the year 1966-1967 ranged from $275 to $1,750.

Total 4 year tuition costs in baccalaureate programs range from $4,380 to $5,500.

The community colleges in Maryland have total 2 year tuition fees for county residents from $400 to $600.

In addition to tuition costs, the prospective nursing student must consider income forgone while studying. The average collegiate nurse's education will, in effect, cost her $16,000 more than an associate degree. In terms of future earnings, is the baccalaureate degree worth $16,000 more than the associate degree? Should there be wider salary differentials?

The Nurse Training Act grant passed by Congress in 1964: 1) provided federal funds to schools of nursing for loans to students in undergraduate programs in all types of professional nursing schools; 2) extended for five years the program of advanced training for graduate nurses; 3) authorized a four-year program of construction grants to assist in providing new or expanded facilities; 4) authorized project grants to enable schools of nursing to improve and extend programs; 5) provided payments to diploma schools to defray part of the cost of training students in order to prevent further attrition of such schools.

The Nurse Training Act of 1964 did not provide scholarship funds. More recent legislation has been enacted to correct this.

NEED AND DEMAND

Need refers to professional estimates of the optimum number of nursing services or number of nurses required. *Demand* is the number of nursing services or nursing positions for which society will pay an adequate salary. Demand is less than "need" and is a better index for health manpower planning. Expert estimates of "need" are useless or misleading unless backed up by proof that society will pay enough to hire the personnel "needed.'

Delivery of nursing services has not been studied sufficiently to permit the analysis of need and demand for *services* or of *productivity* (services for professional per unit time). Therefore, we must express need-demand as nursing positions rather than nursing services. We will refer again to productivity in our conclusions.

The "need" for additional nurses is generally acknowledged. References to "severe" or "acute" shortages are numerous. The hospitals of Maryland stated that their most urgent needs were for registered nurses, aides, orderlies, attendants, and practical nurses, in that order.

Estimates of need have been proposed, some based on systematic study, others on clinical judgment alone. Abdellah and Levine, as a result of a study of the effect of nurse staffing on satisfactions with nursing care in 57 general hospitals in the United States, developed an "ideal" staffing pattern as follows: an average of 4.7 hours total nursing care per patient per day, of which 2.5 hours are provided by professional nurses and 2.2 hours by other nursing personnel. These estimates of need would call for double the nurses now demanded in Maryland. On the basis of this study nursing needs were estimated by the Consultant Group to the Surgeon General.[16] Fifty percent of direct patient care should be provided by professional nurses, 50 percent by licensed practical nurses and aides to provide adequate levels of patient care.

Demand for nurses is difficult to quantify. Budgeted positions, both filled and vacant, represent the best available measure of the demand for nurses.

The Hospital Council study reported more than 1,000 budgeted positions for registered nurses and 650 positions for L.P.N.'s were vacant. This may be compared to the "need" for 1,500 additional registered nurses, 700 additional licensed practical nurses, and 1,300 additional aides and attendants reported from the same hospitals.

Caution must be used in determining demand based on estimates of vacancies in hospitals or other agencies. Budgets are frequently "padded" with salaries for positions in order to provide for unanticipated emergencies.

According to Hiestand, "Almost every writer on the needs and demands for health manpower denigrates the use of simple population ratios and then proceeds to use them with little real qualification. If ratios are inadequate—and they are—considerably more research is needed to assess the relative effect of the diverse trends which have occurred in the past so that more useful methods can be found to estimate the impact of diverse future developments."[15]

In projecting demand for nurses to 1980 we combined population ratios and some purely judgmental estimates of the effect of rising economic levels. The results are presented in the next section.

Projection of Need and Demand

Approximately 19,000 active registered professional nurses would be required in Maryland by 1980 to meet the PHS Consultant Group's estimate of nursing need (four nurses per 1,000 population).[16] This implies more than doubling Maryland's nurse labor force in 13 years.

Estimates based on the reality of modern society's ability and willingness to pay for nurses are somewhat more modest.

The "need" for nurse manpower in Maryland will depend upon the standards set for the health care of its citizens. The desirable ratio of nurses to population in the state could be more or less than the overall national average recommended by the Surgeon General's Consultant Group on Nursing.

Today there are 1,000 budgeted nursing vacancies in Maryland. There are 5,000 unemployed nurses in Maryland qualified to fill those vacancies. Society has apparently not felt that the need to fill the vacancies was important enough to raise wages high enough to attract unemployed nurses (i.e., to translate needs into effective economic demands).

In 1980 will Maryland be any more able and willing to pay for the number of nurses that nursing experts recommend than it was in 1967? We predict that in 1980 the state will demand and pay for not only a greater absolute number of nurses, to take care of increased population, but also for more nurses per capita. We first estimate the total demand for all nurses based on changing population and changing numbers of nurses per capita.

Overall Demand

In the thirteen years from 1949 to 1962 Maryland's demand for nurses increased from 2/1,000 population to 2.4/1,000 population, almost a 20 percent increase. In the thirteen years from 1967 to 1980 we predict a 40 percent increase of nurses per 1,000 population (3.2/1,000) because of overall economic development, a higher percentage of gross national product going to health, and the Medicare and Medicaid programs. *A total of some 14,900 nurses will be demanded.*

Demand by Type of Practice

But estimating the overall demand for nurses is not enough. To provide a useful guide for Maryland we must separate out the demand for each type of practice.

1. Projecting present demands for hospital and long-term care facility nurses (full-time and budgeted vacancies) to 1980 using the projected 20 percent increase in hospital beds gives a figure of 9,600 nurses demanded. However, we believe that 1,000 additional nurses will be demanded by increased staffing in nursing home and long-term care facilities.
2. In order to approximate the recommended ratio of one public health nurse to 2,500 population, when services to the sick at home are provided, it would be necessary to increase the number of nurses in public health to 1,900 by 1980 based on projected population estimates. This is a 100 percent increase over present numbers employed in public health. We believe that the demands of some health care agencies will mushroom in the next 13 years.
3. For the projection of demand for nurses in doctors' offices and "other" nurses, past trends have been combined with population increases. Demand for private duty nursing is decreasing while demand

for all other categories is increasing. Demand for doctors' offices will be 900 and "other" 700.

4. Also of special concern is the number of nurse faculty members in order to assure the future quantity and quality of nurse manpower. To meet the needs of teaching programs of 1980 we estimate that there should be on the average one nurse instructor for every six students, at all levels, or 600 nurses in teaching.

Both methods of estimating demand agree quite closely. The aggregate estimate of demand for nurses in all types of practice is 14,700. This approximates the estimate of total demand in 1980 for 14,900 nurses.

Demand by Category

The report of the Surgeon General's Consultant Group recommended an increase in the supply of nurses who will assume leadership as faculty members, supervisors and administrators and specialized clinical specialists. By 1980 approximately 10 percent of the 14,700 nurses needed in Maryland should hold a master's or higher degree, 25 percent would hold baccalaureate degrees and the remainder, 65 percent, would be prepared at the associate degree or diploma level.

The estimate of demand for L.P.N.'s, aides and attendants is based on a simple extrapolation of 12,000 existing positions and vacancies (rough average of PHS and Hospital Council data) to the 1980 population. We believe that the demand for L.P.N.'s will rise faster than the demand for aides and will actually lower the demand for aides.

In summary, Table 3-11 presents our composite estimate of Maryland's demands for nurses in 1980. How the demands diverge from anticipated supply and how the differences may be reconciled is discussed in the next section.

TABLE 3-11

ESTIMATED DEMAND FOR NURSES, 1980

Field of Practice	M.A.	B.A.	Assoc. Arts & Diploma	Total
Hospital and long-term facilities	700	2200	7700	10,600
Doctors' offices	---	200	700	900
Public Health	300	1000	600	1,900
Teaching	400	200	—	600
Other	100	100	500	700
Total	1,500	3,700	9,500	14,700

TABLE 3-11 (Continued)

ESTIMATED DEMAND FOR NURSING AUXILIARIES 1980

	LPN's	Aides and Attendants	Total
Hospitals	6,000	9,000	15,000

FUTURE SUPPLY

In projecting supply of nurses to 1980 we are painfully aware of the problems in using the state as a basis for manpower planning. There are no complete figures available on nurses' in-migration, out-migration, and retirement and re-entry to the labor force in Maryland. Thus we are forced to use approximate methods.

We estimate the number of graduates for 1968, add these to the number of nurses currently in the labor force, deduct 4 percent for attrition. We then follow the same procedure year by year until 1980.

Attrition includes those leaving nursing after a few years as well as deaths and retirements. The 4 percent rate is based on national figures and was used by the Surgeon General's Consultant Group on Nursing in their national projections of nurse supply. Maryland has a slightly more favorable (younger) age distribution than the nation, but a higher rate of inactive nurses. We believe that these forces will balance, making the 4 percent national attrition rate a reasonable one for use in Maryland.

Our estimates of numbers of graduates are as follows:

1. Diploma programs will continue to average 520 graduates per year until 1980. There is reserve capacity in the diploma schools–more nurses could be trained. If the target is not reached, inadequate recruitment of students would be the likeliest cause. (Some 30 diploma nurses per year will probably take the special course for a baccalaureate degree, resulting in a loss of some 400 diploma nurses over 13 years.)

2. Associate in arts graduates should increase to 160 per year by 1970 (a stated capacity of 245 admissions, allowing one third attrition). If the target is not reached, emphasis on recruitment would seem appropriate.

3. Baccalaureate graduates should gradually increase to 230 per year by 1970 (admission capacity is higher to allow for drop-outs). The diploma nurse conversions are included in this estimate.

4. Master's level nurses will graduate in classes of 55 increasing steadily to 68 by 1980. (It should be noted that master's level nurses will not represent additions to the overall total of nurses, for they are drawn from the baccalaureate group.)

The total supply of nurses predicted for 1980 is 14,100–

900	Masters and above	(6%)
2200	Baccalaureate	(16%)
9550	Diploma	⟺ (75%)
1450	Associate in Arts	

Maryland enjoys a positive net immigration of some 200 nurses every year. Although the number is decreasing, the addition of 200 nurses provides a safety factor in assuring enough nurses to meet demand in 1980.

	1963	1964	1966
In-migration	774	755	882
Out-migration	490	542	679
Net migration	284	213	203

These predictions may be under-estimates if new schools are opened, programs expanded, or if increased salaries lure inactive nurses back to practice. They may be over-estimates if recruitment is ineffective or nursing salaries fail to keep up with the general rise in wages.

CONCLUSIONS AND RECOMMENDATIONS

A. *Today Maryland has a nursing shortage* **with over 1000 budgeted vacancies for registered professional nurses in hospitals alône. Yet over 5000 registered nurses are not practicing and there are unfilled places in most diploma and associate degree programs.**

However, by 1980 the overall shortage of professional nurses will have markedly decreased, if: **a) associate degree programs expand as planned and b) future supply and effective economic demand for nurses follow expected trends.**

Recommendation 1:

Existing associate degree programs should expand enrollment as rapidly as possible to the planned capacity. However, no new schools should be opened unless a real need can be demonstrated and availability of qualified faculty is assured.

Recommendation 2:

Hospitals should continue their programs to make hospital nursing more attractive to the large reservoir of inactive nurses. As the Hospital Council states:

Part of the manpower problem rests with hospitals. Unattractive working conditions, low pay, and rigid stratification, tend to make it difficult to get and keep personnel. Hospitals must correct these and at the same time use imagination and ingenuity in finding new and more efficient ways of utilizing their personnel.

Recommendation 3:

The Hospital Council of Maryland should implement its proposed program to recruit, retrain, and retain nurses. Refresher courses to re-recruit inactive nurses should be continued.

Recommendation 4:

Diploma nursing schools and associate degree programs should provide high school students and their counsellors with accurate and current information about nursing programs and careers in nursing.

Recommendation 5:

No new diploma programs should be opened, but steps should be taken to insure maintenance of current enrollment levels.

B. *The demands for baccalaureate and master's level nurses will exceed the supply available in 1980.*

Recommendation 6:

Additional collegiate facilities are needed. The Johns Hopkins School of Nursing, the only diploma school in Maryland associated with a university, should be encouraged to convert to a baccalaureate program. Additional *collegiate* schools should be opened only with proof of need and evidence of availability of qualified faculty.

Recommendation 7:

Establishment of an additional graduate program should be considered as part of future planning.

C. *Today there are 650 budgeted vacancies for licensed practical nurses in hospitals alone. Yet, 840 practical nurses are inactive, and practical nursing schools are not filled to capacity.*

Recommendation 8:

Practical nursing schools should carry out more effective student recruitment.

Recommendation 9:

No new practical nursing schools should be considered until present schools are better utilized.

Recommendation 10:

Hospitals should expand their efforts to recruit inactive practical nurses.

Recommendation 11:

Hospitals should expand nurse-aide training programs.

D. *Increasing needs for nursing services and rapidly rising costs of medical care require reappraisal of quality and efficiency of nursing services.*

Recommendation 12:

Experiments with new work patterns for more effective utilization of nurse personnel should be made. These new work patterns should be part of prospective studies of patient care to determine the type of personnel best fitted for specific responsibilities.

Recommendation 13:

Studies should be conducted to determine the feasibility and practicality of having nurses with special training assume expanded patient care responsibilities such as pediatric nursing, nurse-midwifery, and geriatric nursing.

E. *Continuing evaluation of nurse manpower is necessary for effective planning.*

Recommendation 14:

Future health planning activities in Maryland should include nurse manpower planning.

Recommendation 15:

To facilitate future evaluation and planning, the State Board of Examiners of Nurses should have access to modern data processing facilities.

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CHAPTER 4

DENTAL MANPOWER

The Needs for Dental Care

The almost overwhelming problem of dental need among citizens of the United States is brought out by a United States Public Health Service report[1] which estimates these needs as including:

1. One billion unfilled cavities.
2. Thirty percent of the population over thirty-five years of age; forty percent, over forty-five years of age; and fifty percent, over fifty-five years of age have lost *all* of their natural teeth. (At least sixteen million of these people have no dentures.)
3. Twenty percent of American children have severe orthodontic conditions, and sixty percent have conditions which would be improved through treatment. (Many of these conditions are the result of not receiving proper dental care for decayed deciduous teeth.)
4. Among people having natural teeth, sixty-five percent of young adults, eighty percent of the middle aged, and ninety percent of the people over sixty-five suffer from periodontal disease.

Need and Demand

Need for dental care constitutes only potential demand. Need, however, is a reservoir from which demand comes, and must, therefore, be considered in regard to factors which might be expected to alter either:

1. The magnitude or extent of need or
2. The rate at which potential demand becomes a actual demand.

The magnitude or extent of need for dental care is difficult to assess because "need" cannot be defined in a way acceptable to all people. A condition that might be considered by a dentist to be clear cut need for care might still be of little or no concern to the person having the condition. In considering need in the sense of potential demand, however, a reasonable and workable definition would seem to be "any structural, functional, or pathological condition susceptible to elimination or improvement through treatment." Such definition underlies the cited United States Public Health Service estimate. Conditions reported would benefit from treatment, but until treatment is sought no manpower is needed to provide care. Realistic requirements for manpower are determined only on the basis of actual demand.

DEMAND FOR DENTAL SERVICES

Until the National Health Survey was begun on a continuing basis in 1958, the accepted method for estimating demand for dental services was based upon the assumption that existing ratios of population to dentists were a reflection of such demand. Determinations of future requirements for dental manpower thus were based upon projections of numbers needed to maintain or to improve the ratio; and it is true in a completely free, competitive situation it could be argued validly that an existing ratio of dentists to population is a reflection of demand for services. Such is not the case here, however, because the number of dentists in the United States is restricted by the limited availability of facilities for dental education, restricted to the extent that fewer than half of qualified applicants are accepted in dental schools.

In order to allow comparisons with other dental manpower studies in which ratios were used in determining manpower requirements, similar data will be presented here. Such data indicate that existing shortages of dentists will become more severe with time both nationally and within Maryland because population will increase more rapidly than numbers of dentists. Now that more reliable data and methods are available for projecting requirements, the major value of ratio determination is as a means for analyzing distribution of manpower. Such analysis in this study will consist of comparisons of ratios of population to dentists among counties and regions within the state, and a comparison of the ratio for Maryland with other states.

It was pointed out in the introduction the problem of manpower is not simply one of quantity, but also one of distribution as is clearly shown by population per dentist ratios for Maryland in 1964, Table 4-1.*

Reasons for inequitable distribution of dentists within a state include:

1. Greater effective economic demand for services within urban areas.
2. The cultural attraction of urban areas for professional men.

Inequity of distribution, however, is not confined to areas within states. It is also found between states. To some degree reasons for within state inequalities apply to inequalities between states. However, these reasons do not completely explain the interstate differences.

Another reason is differences in availability of dental education facilities within states. Even this does not complete the explanation however, for some states not having a dental school have far greater proportions of their citizens seeking dental education than others which have a dental school. In 1964-1965,

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*Unless otherwise noted, data referred to as current are based upon calendar year 1964. Reasons for this are:

1. Availability of a nearly complete inventory of dentists licensed in Maryland as of December, 1964.
2. The most recent "Survey of Dental Practice" by the American Dental Association is based upon calendar year 1964.
3. As of the time of this study the actual practice location could not be determined for many 1965, 1966, and 1967 dental graduates who still were in military service or just returning from such service.

TABLE 4-1

NUMBER OF PERSONS IN THE POPULATION PER DENTIST MARYLAND, 1964

(U.S. ratio = 1714:1 Adjusted ratio = 2125:1)

Regions and Counties	Population (1000's)	Number of Dentists	Population per Dentist	
Western Maryland	287.3	95	3024	
Allegany	85.4	34	2512	
Frederick	78.3	29	2700	
Garrett	22.0	4	5500	
Washington	101.6	28	3629	
Baltimore Region	1913.4	793	2413	
Anne Arundel	273.3	57	4339	
Baltimore City	925.1	552	1676	
Baltimore County	549.0	124	4427	2181
Carroll	57.6	21	2743	
Harford	89.5	28	3196	
Howard	44.5	11	4082	
Southern Area	99.6	17	5859	
Calvert	18.7	4	4675	
Charles	36.7	5	7340	
Saint Mary's	44.2	8	5525	
Washington Region	878.5	412	2132	
Montgomery	412.3	266	1550	
Prince Georges	466.2	146	3196	
Eastern Shore	765.5	70	3793	
Caroline	19.2	6	3200	
Cecil	55.8	8	6975	
Dorchester	31.0	7	4429	
Kent	18.1	5	3620	
Queen Anne's	17.5	2	8750	
Somerset	19.6	2	9800	
Talbot	25.5	10	2550	
Wicomico	54.1	22	2459	
Worcester	24.7	8	3088	
Maryland	3444.3	1402	2456	
***Maryland** (adjusted)	3444.3	1315	2618	

***Adjustment consists of deducting as "not available for patient care" dentists licensed to practice but otherwise employed.**

for example, one of every 13,945 citizens of Maryland was in attendance at a school of dentistry, (25th among all states) while Utah which does not have a dental school had one of every 5,607 citizens in dental school. We have no ready explanation for the interstate differences in popularity of dental education.

A survey of residences of applicants for admission to the University of Maryland Dental School shows the disproportionately low interest in dentistry in Maryland is beginning to change. However, in spite of this encouraging development, past lack of interest will make itself felt for many years to come.

How Maryland compares in ratio of persons per dentist and in per capita income with other states is shown in Table 2. Data are from the American Dental Association's "Facts About States for the Dentist Seeking a Practice Location, 1966".[2] Ratios shown are more favorable than actually is the case because they include many dentists not engaged in patient care, but they are suitable for comparisons.

With the exception of Maryland, states selected from each region shown are those with the most favorable and least favorable population per dentist ratios.

On the basis of its favorable ranking in regard to per capita income it is surprising to find Maryland ranked so poorly regarding population per dentists. In relation to national averages for population per dentist and per capita income, Maryland has a per capita income thirteen percent above the national average and a ratio of population per dentist thirty-one percent below the national average.

Judging from these comparisons of Maryland with other states, it is concluded that Maryland's citizens have economic resources adequate to attract proportionately greater numbers of dentists than presently is the case.

Effect of Fluoridation on Demand

Many experts prophesied that fluoridation of the water supply would drastically reduce the demand for dental care, for fluoridation has been shown to reduce caries attack rates in children by fifty percent. Nowhere, however, has it been shown that fluoridation has resulted in reduction in actual demand for care. Several factors contribute to this situation:

1. In spite of reduction in caries rates resulting from fluoridation, the reservoir of need for dental care is so great that transformation of any appreciable proportion of this potential demand into actual demand results in a substantial requirement for dental service. Two factors contributing to such a transformation at an accelerating rate are:
    a. Increasing income among ever greater proportions of a growing population and
    b. Governmental health programs which underwrite the expense of dental services.

2. As a result of fluoridation many teeth which otherwise would have been lost early in life are maintained into later years. Many of them eventually will decay because of lengthened exposure to the still present caries producing environment in most people's mouths—fluoridation acts by increasing resistance to decay, not by eliminating or reducing the causes of decay. Furthermore, as shown in the data previously noted regarding periodontal disease, most of the teeth saved from loss through decay will become involved with periodontal disease.

3. With reduced rates of caries attack during childhood and adolescence, the investment required to maintain the teeth during these periods is reduced by about fifty percent.[3] As a result parents who otherwise might have been discouraged from attempting to provide regular dental care for their children, now find they can afford such service.

In summary, fluoridation is not a panacea for dental ills, yet it does make a definite positive contribution to health by making possible improved oral care for increased numbers of people at lower incremental costs per person.

Income-Related Demand for Dental Services

Analysis of data from the Household Interview Survey of the National Health Survey for the period of July, 1963 to June, 1964 shows that certain personal (demographic) characteristics are related to demand for dental services. Among these characteristics the most significant are level of family income and educational level of the head of the family, both of which are positively correlated with increased demand. Further analysis of a cross-tabulation of these factors shows that of the two, family income level more greatly influences demand; and most importantly in predicting future demand there will be greater changes in income levels than in education levels.

For this reason family income level has been selected as the most important characteristic upon which to base estimates of future demand. It should be kept in mind, however, that actual future demand for dental services will probably be higher than our estimate on the basis of income alone because increasing educational levels also will be operating to increase demand.

Further substantiating the dominance of income level as the determining factor in demand for dental services is an analysis of difference reported in rates of demand between whites and non-whites. This difference, significant when a direct comparison is made, is virtually eliminated when demand from the two groups is standardized for income. Thus, at a given level of income, demand for dental services among whites and non-whites was found to differ only very slightly.

Table 3 shows predicted 1980 proportions of populations by income class among major jurisdictions under consideration. Note that projected income is in terms of 1960 dollars.

TABLE [illegible]-2

SELECTED COMPARISON OF SEVERAL STATES AND REGIONS RELATIVE TO POPULATION PER DENTIST (1965) AND PER CAPITA INCOME (1964)

Region and State	No. of Dentists	Population per Dentist	Nat'l Ranking Relative to Pop. per Dentist	Per Capita Income	Nat'l Ranking Relative to per capita Income
NEW ENGLAND	7,612	1,539	*	2,847	*
Main	453	2,192	30	2,130	35
Massachusetts	3,861	1,394	4	2,922	10
MIDDLE EAST	28,818	1,476	*	2,900	*
District of Columbia	782	1,023	1	3,515	1
Maryland	1,536	2,242	31	2,888	11
W.Virginia	677	2,630	41	1,962	40
SOUTHEAST	14,541	2,273	*	1,912	*
S.Carolina	609	4 187	51	1,647	48
Florida	2,899	2,025	22	2,280	30
SOUTHWEST	5,936	2,618	*	2,161	*
New Mexico	322	3,221	45	2,010	39
Oklahoma	944	2,426	37	2,095	36
CENTRAL	27,257	1,813	*	2,654	*
Indiana	2,278	2,164	27	2,529	20
Minnesota	2,516	1,431	5	2,373	25
NORTHWEST	5,222	1,882	*	2,291	*
Nebraska	943	1,552	9	2,302	29
S. Dakota	300	2,356	35	1,832	45
FAR WEST	15,838	1,561	*	2,984	*
Nevada	185	2,164	27	3,248	4
Oregon	1,523	1,252	3	2,602	16
*UNITED STATES	104,824	1,714	*	2,550	*

*Dentists in Federal Dental Services are not included.

TABLE 4-3

PERCENTAGE DISTRIBUTION OF INDIVIDUALS BY FAMILY INCOME OR BY PERSONAL INCOME IF LIVING ALONE 1980 ESTIMATED (1960 Dollars)

Income Levels (1960 Dollars)	Percentage of Individuals*		
	Maryland	Washington Metropolitan Area	Maryland less Montgomery & Prince George's counties
0–4,999	16.3%	8.9%	19.6%
5,000 –9,999	37.6%	22.4%	44.4%
10,000–14,999	24.7%	20.8%	26.4%
15,000 & over	21.5%	48.0%	9.7%

*Maryland data derived from a straight line extension of a projection through 1976 made by the National Planning Association "Regional Economic Projection Series . . . " (4) Washington Metropolitan Area data: "Regional Development Guide . . . " (5)

Data from the National Health Survey show the following relationships between family income level and number of dental visits made during the period July, 1963-June, 1964:

TABLE 4-4

NUMBER OF DENTAL VISITS PER PERSON PER YEAR BY FAMILY INCOME - U.S. July, 1963-June, 1964

Family Income (Dollars)	Average Number of Dental Visits per Person
0–4,999	.91
5.000–9.999	1.75
10,000–14,999	2.56
15,000 & over	3.44

Assuming that demand for services by income category will equal at least these levels in 1980, an estimate can be made of the expected minimum average number of visits per person in any population for which information is available regarding projected distribution of individuals by income classes.

TABLE 4-5
AVERAGE NUMBER OF DENTAL VISITS EXPECTED PER INDIVIDUAL PER YEAR BY 1980

	Family Income (1960 dollars)				
	0– 4,999	5,000- 9,999	10,000 14,999	15,000 & over	
Mean Number of Visits per person per year	**0.91**	**1.75**	**2.36**	**3.44**	
Maryland					
Percent of population	16.3	37.6	24.7	21.5	
Weighted contribution	.1480	.6580	.6313	.7386	2.18
D.C. Metropolitan Area					
Percent of population	8.87	22.35	20.75	48.03	
Weighted contribution	.0807	.3911	.5312	1.6522	2.66
Maryland Less Montgomery & Prince Georges Counties					
Percent of Population	19.6	44.4	26.4	9.7	
Weighted contribution	.1779	.7763	.6756	.3368	1.96

Having determined the average number of visits per person expected in 1980 an estimate can be made of total demand for visits for each jurisdiction.

TABLE 4-6
PROJECTED DEMAND FOR DENTAL VISITS, 1980

Jurisdiction	Average Number of Visits per Person	Projected Population (1000's)	Total Visits
Maryland	2.18	4,678.5	10,199,130
D.C. Metropolitan Area	2.66	3,251.4	8,648,724
Maryland less Montgomery & Prince Georges	1.96	3,278.0	6,414,880
Montgomery & Prince Georges Counties	2.66	1,436.6	3,821,436
Maryland plus D.C. Metropolitan Area		6,529.4	15,026,418
Western Maryland	1.51	331.9	500,245
Baltimore Region	2.01	2,507.4	5,030,871
Southern Maryland	1.07	144.8	154,299
Eastern Shore	1.44	293.9	711,216

These projected demand figures do not reflect increases in demand expected to result from governmental programs to underwrite the expense of services for indigent people. In addition to Title XIX of the Social Security Act which already is operating in a number of states, including Maryland, Senate and House approved versions of a National Children's Dental Health Act have been passed and referred to a joint legislative committee for final action.

The impact of such legislation on demand for dental services comes of course in the lowest income brackets. Assuming most people in these brackets fall within the more poorly educated segments of the population, data from the National Health Survey indicate that demand for services among these people will very nearly double. (The effect of this demand on manpower requirements should be evaluated as the programs develop.)

DENTIST PRODUCTIVITY

Data from the triennial "Survey of Dental Practice" of the American Dental Association show a steady increase in dentist productivity measured in terms of patient visits. Although the increase has been steady during the period, the rate of increase has been declining. Thus, while the total increase over a fifteen year period was 25 percent (uncompounded), the increase during the most recent six years was only 6.5 percent.

Since the rate of increase has been declining toward an uncompounded rate of 1 percent per year, this rate of increase was selected as appropriate for projection to 1980 as a means for estimating dentist productivity at that time.

Mean number of patient visits for dentists of all ages reported in the "1965 "Survey of Dental Practice" was 3,343. Applying an average increase of 1 percent per year (uncompounded) to this figure, productivity in 1980 should average 3,844 patient visits per dentist.

In regard to individual variances, several factors have been shown to be related to productivity of dentists. Among the more important of these are ages of practicing dentists, and numbers of auxiliaries employed. Based on data from the American Dental Association's "1965 Survey of Dental Practice", Table 7 shows the empirical relationship between age and productivity and Table 8 shows the empirical relationship between number of full time auxiliaries employed and productivity.

The age distribution of dentists in Maryland and the Washington Metropolitan area closely approximates that of the sample from which these data were derived (Table 7).

Maryland dentists employ an average of 1.02 auxiliaries, and Washington Metropolitan Area dentists employ an average of 1.29, while the national average reported in "The 1965 Survey of Dental Practice" is 1.51.

After considering the variances in ages of dentists and number of auxiliaries employed in Maryland and the Washington Metropolitan Area in comparison with national data the conclusions drawn are:

1. Productivity of Maryland dentists would be expected to be lower than the national figure because of a slightly lower age-related productivity, and a considerably lower utilization of auxiliaries. Use of the national estimate of productivity, therefore, constitutes a *conservative bias in estimating future requirements for dentists in Maryland.*

TABLE 4-7

AVERAGE NUMBER OF PATIENT VISITS OF NON-SALARIED DENTISTS IN 1964, BY AGE OF DENTIST

Age of Dentist	Mean Number of Patients
-29	2294
30-39	3698
40-49	3815
50-59	3293
60-69	2366
70-	1527
All Ages	3343

TABLE 4-8

MEAN NUMBER OF PATIENT VISITS OF NON-SALARIED DENTISTS IN 1964, BY NUMBER OF FULL TIME AUXILIARY PERSONNEL

Number of Auxiliary Personnel	Mean Number of Patient Visits
0	2355
1	3015
2	3946
3	4409
4 or more	6170

2. Productivity of Washington Area dentists would be expected about to equal the national figure because of a somewhat higher age-related productivity and a somewhat lower utilization of auxiliaries.

Accepting then the projection of dentist productivity of 3844 in 1980, an estimate can be made of numbers of dentists required to meet the projected demand for dental visits.

Requirements for Dentists

The number of dentists required to meet expected demand for services in 1980 is determined by dividing projected demand for visits by the number of visits the average dentist will accept.

TABLE 4-9

REQUIREMENTS FOR DENTISTS, 1980

	Projected Number of Patient Visits	Projected Dentist Productivity (Patient Visits)	Requirements for Dentists
Jurisdiction			
Maryland	10,199,130	3834	2653
D.C. Metropolitan Area	8,648,724	3844	2250
Maryland less Prince Georges & Montgomery	6,414,880	3844	1669
Montgomery & Prince Georges Counties	3,821,436	3844	994
Maryland plus D.C. Metropolitan Area	15,063,604	3844	3919
Western Maryland	500,245	3844	130
Baltimore Region	5,030,871	3844	1312
Southern Maryland	154,299	3844	41
Eastern Shore	711,216	3844	186

FUTURE SUPPLY

Having estimated requirements for dentists in 1980 the next step is to compare these estimates with estimates of expected supply of dentists under prevailing conditions and trends.

Table 10 shows the numbers of dentists expected to be still in practice in 1980 when the following adjustment factors are applied to the 1964 dentist population:

1. Death rates applied are those published in an article, "Mortality of Dentists, 1951-1954"; Journal of the American Dental Association, Volume 52, pages 65-72, January 1966.
2. Retirement rates are based upon productivity of dentists at various ages. Thus dentists at ages 60-69, for example, average 30 percent

TABLE 4-10

PROJECTED NUMBER OF DENTISTS ENGAGED IN CIVILIAN PATIENT CARE, 1980

	Number of Licensed Dentists 1964	Loss through death, retirement or activity other than patient care	No. of 1964 dentists expected to be in patient care, 1980	Expected input of dentists 1964-1980	Projected no. of dentists active in patient care, 1980
MARYLAND	1398	521	877	728	1605
D.C. Metropolitan Area	1356	542	814	720	1534
Maryland less Montgomery & Prince Georges	986	424	562	432	994
Montgomery & Prince Georges	412	97	315	296	611
Maryland plus D.C. Metropolitan Area	2342	966	1376	1152	2528
Western Maryland	95	30	65	43	108
Baltimore Region	793	312	481	328	809
Southern Maryland	16	5	11	10	21
Eastern Shore	70	29	41	21	62

fewer patient visits than do dentists of all ages, so 30 percent of dentists reaching age 65 are considered retired, and all dentists are assumed to be retired at age 80.

3. The number of dentists engaged in activities other than patient care in 1980 is considered to be the same as in 1964.

4. Input of dentists is assumed to be essentially what it has been in the recent past.

Comparing estimates of projected requirements for dentists and projected supply of dentists, minimum estimated shortages of dentists in 1980 will be as follows:

Maryland	1048
D.C. Metropolitan Area	715
Maryland less Montgomery & Prince Georges	665
Montgomery & Prince Georges	383
Maryland plus D.C. Metropolitan Area	1380
Western Maryland	22
Baltimore Region	503
Southern Maryland	20
Eastern Shore	124

If corrective action could be taken *as early as 1968, the increased input* of dentists needed each year in order to meet the projected 1980 requirement would be as follows:

	Increased Input Needed	Current yearly input	
		Gross	Net*
Maryland	77	45.5	16.5
D.C. Metropolitan Area	51	45.0	18.0
Maryland less Montgomery & Prince Georges	50	27.0	3.0
Montgomery & Prince Georges	27	18.5	13.5
Maryland plus D.C. Metropolitan Area	101	73.0	21.0

***Net input equals number of dentists entering practice (gross input) less dentists retiring or dying.**

The total yearly input needed for Maryland thus would be 123, but this does not include requirements to meet demand from persons covered by governmental health programs.

If requirements are included for dentists needed to meet the increased demand expected to be generated under Title XIX of the Social Security Act, increased input of dentists each year would have to be as follows:

	Increased Input	Total Input Needed
Maryland	90	136
Washington Area	56	107
Maryland "less" Mont. & P.G.	61	101
Montgomery & Prince Georges	29	[illegible]
Maryland "plus" D.C.	117	208

Futher expansion of governmental support for providing dental services such as passage of the National Children's Dental Health Act would result in even greater requirements for dentists.

Obviously, corrective action of the magnitude needed could not be undertaken quickly enough to start showing results by 1968, even if the action to be taken was clear cut and agreed upon. Several possible courses of action are available.

COURSES OF ACTION

Courses of action which would lessen the projected discrepancy between demand for dental services and ability to provide for this demand are:

1. Attract and/or produce more dentists.
2. Increase dentist productivity.
3. Reduce demand for dental services.

Attract More Dentists

As far as attracting more dentists is concerned, it would seem that from the point of view of comparative income levels Maryland and the Washington Metropolitan Area should do very well. Yet, this has not been the case in the past for Maryland which had a 1964 ratio of population to dentists much poorer than the national average; and while the Washington Area's ratio was considerably better than this average, this was because of the high concentration of dentists in the District of Columbia. Maryland's two Washington Area counties had a ratio just about equal to the national average.

Furthermore, the nation as a whole faces a severe shortage of dentists, so the problem is not susceptible to solution simply through redistribution of available resources.

Produce More Dentists

In order to produce more dentists, Maryland has several possible courses of action available:

1. Build an additional dental school.
2. Increase the size of the University of Maryland Dental School.
3. Increase the proportion of students from Maryland admitted to the University of Maryland Dental School.

Building and staffing an additional dental school is a long range solution, the pay-off from which would become manifest only after a considerable lag time, but one that should be given serious consideration in light of the magnitude of the manpower shortage predicted. Yet, considering the number of additonal dentists needed each year, even another school will not solve the problem unless a higher proportion of graduates remain in practice in Maryland than has been the case in the past.

Of dentists practicing in Maryland in 1964, 68 percent were graduates of the University of Maryland Dental School, yet a survey of selected classes graduated during the period 1949-1962 shows that the proportion of graduates remaining in practice in Maryland as of 1964 was only 33 percent.

Actually this percentage almost exactly equals the percentage of Maryland residents included in the classes surveyed. On this basis it could be concluded that Maryland gains in practicing dentists from its dental educational efforts in proportion to the number of Maryland residents accepted into the University Dental School.

Since 1960 the proportion of Maryland residents included in classes at the Dental School has increased from a 1950-1960 average of 30 percent to an average of 45.5 percent for the period 1960-1966. The proportion of Maryland residents in the current freshman class is 60 percent, and indications are the proportion eventually may reach 80 percent. These increases would be expected to result in higher input rates of practicing dentists in Maryland, but it is too early yet to be sure this will happen. In any case, while any increase in input will be welcomed, the needed increase far exceeds the level of increase expected from this action.

Judging from past experience, further increasing the proportion of Maryland residents accepted in the University Dental School would be expected to result in an additional increase in numbers of dentists entering practice in Maryland. However, whether the increase of dentists in practice would equal the increase in Maryland residents admitted to the school is questionable in spite of the pattern of the past. The reason for this is that although the number of graduates from the University Dental School who have remained in practice in Maryland has equalled the number of Maryland residents among the graduates, only 75 percent of those remaining have been pre-school residents of Maryland. The remaining 25 percent have been out-of-state students who have elected to remain in Maryland. An increase in the proportion of Maryland students admitted to the University Dental School would, therefore, result in a decrease in the number of out-of-state students admitted. As a result, the pool from which to attract out-of-state residents to practice in Maryland would be reduced, and a smaller number would be expected to remain while the 25 percent of Maryland residents who leave the state after graduating would become larger in actual number.

In spite of this, however, the overall expected result of an increased acceptance rate of Maryland residents would be an increase in practicing dentists within the state. For example, assuming a 75 percent retention rate among Maryland residents with a 25 percent rate among out-of-state residents, a class with 45 percent Maryland residents would be expected to produce 46 dentists who would remain in practice in Maryland while a class with 60 percent Maryland residents would be expected to produce 55 dentists, and one with 80 percent Maryland residents would be expected to produce 65 dentists.

A 25 percent increase in size of class at the University Dental School is planned for 1969. Provided the proportion of Maryland residents accepted in this and subsequent classes is maintained at least at its present level, the number of dentists entering practice in Maryland can be expected to increase proportionally. Based on the present proportion of 60 percent Maryland residents admitted, a class of 125 should produce 69 dentists for Maryland while increasing the proportion of Maryland residents admitted to 70 percent should produce 75 dentists for Maryland. An increase to 80 percent should produce 81 dentists, still far short of the 136 per year needed.

In theory this approach seems quite promising as a means of increasing the number of dentists practicing in Maryland, but whether the promise becomes reality depends on whether current increased interest in dentistry continues. Previous lack of interest is shown by data from the period 1956-1966 when even though only 40 percent of students entered in the University of Maryland Dental School were residents of Maryland, they represented nearly 77 percent of all Maryland residents in dental school anywhere.

In summary, increasing the proportion of Maryland residents accepted in the University Dental School would be expected to result in an increased number of dentists entering practice in Maryland, but materialization of this promise depends upon sustaining the increased interest in dentistry beginning to be shown by Maryland residents.

Increase Dentist Productivity

Of all possible ways in which dentist productivity can be increased none is nearly so promising as increased use of auxiliaries. Data from the American Dental Association's 1965 Survey of Dental Practice show the following empirical relationship between dentist productivity measured in terms of patient visits and number of auxiliary personnel employed.

TABLE 4-11

MEAN NUMBER OF PATIENT VISITS OF NON-SALARIED DENTISTS IN 1964, BY NUMBER OF AUXILIARY PERSONNEL

Number of Full time Auxiliary Personnel	Mean Number of Patient Visits	Percentage Increase in Productivity
0	2355	–
1	3015	28%
2	3946	67%
3	4409	87%
4 or more	6120	162%

The rates of increased productivity associated with increased numbers of auxiliaries in the dental office are even more impressive when it is realized that with the exception of dental hygienists dental auxiliaries are severely restricted in what legally they can contribute directly to patient treatment.

When considering the contribution auxiliaries might make to dentist productivity in Maryland, it must be kept in mind that Maryland dentists will have to employ 50 percent more auxiliaries than they now do even to reach the national average upon which the rates of productivity being discussed are based.

In view of the major increases in productivity made possible through the employment of auxiliaries, the question is raised why more dentists do not employ more auxiliaries, especially in light of other studies which show that the overhead as percentage of gross income in a dental practice remains constant regardless of number of auxiliaries employed. This means that the expansion of gross income made possible through employment of increased numbers of auxiliaries results in a corresponding increase in net income. One therefore is led to wonder whether the relatively low ratio of auxiliaries to dentists found in dental offices is a reflection of limited imagination and initiative among dentists. Examination of the type of clinical training received in most dental schools lends support to this hypothesis. In most schools dental students receive only familiarization training in practicing dentistry with efficient auxiliary support. Most clinical training is carried out in individual or solo practice. As a result while the student develops some appreciation for the benefit of proper auxiliary support, he does not come to believe that the degree of success he experiences in the practice of his profession has a direct relationship to how fully he makes use of such auxiliary support.

Logically the way to remedy this situation would be for dental schools to include proper auxiliary support in all clinical experience. In this way the dentist would learn to practice only in that way that has been shown to result in increased productivity.

Providing this kind of training would require the employment of a considerably increased number of auxiliary personnel in the University Dental School(s) and/or the establishment of courses for dental auxiliaries whose clinical training could be coordinated with that of dental students.

A combination of full time auxiliaries supplemented by student auxiliaries has the double advantage of teaching future dentists to employ auxiliaries effectively while simultaneously increasing the supply of auxiliaries. As the demand for auxiliaries increases additional courses for training them will be required. Several community colleges already have expressed interest in starting courses for dental assistants; and considering the shortage of auxiliaries reported by Maryland dentists in 1964, it appears such action will be beneficial.

TABLE 4-12
UNFILLED AUXILIARY POSITIONS IN OFFICES OF DENTISTS IN PRIVATE PRACTICE, MARYLAND, DECEMBER, 1964

Type Position	Shared	Full time	Less than full time	Total	Full time Equivalent
Hygienist	6	39	23	68	54
Assistant	1	51	13	65	58
Technician		19	5	24	21
Secretary-Receptionist	4	27	5	36	32
Other	1	1	1	3	2
TOTAL	12	127	47	186	157
Full Time Equivalent	6	127	24	157	157

At present Maryland has one two year course for dental assistants offered by Montgomery Junior College which graduates 16 students per year, and no courses for dental hygienists or dental technicians. Three schools are planning or at least giving serious thought to starting courses in dental assisting; three, to courses for dental hygienists; and three, to courses for dental technicians.

Dental Hygienists

Under Maryland Dental Law Act, hygienists are the only auxiliaries who legally can provide direct services for patients. As of 1964 Maryland had 54 full time hygienists employed in dental offices. It is estimated that these 54 hygienists had a capability of providing slightly less than 4 percent of total services rendered in Maryland dental offices at that time. Yet, the National Health Survey shows that approximately 14 percent of patient visits to dental offices are for services dental hygienists are licensed to provide.

Reduce Demand for Dental Services

Unless personnel resources for providing dental services are sufficient to meet future demand, it is reasonable to expect that costs of services will increase thereby maintaining an equilibrium between supply and economically effective demand.

If a shortage is considered to be an imbalance between supply and economically effective demand, no shortage of dental services would be expected to occur. What would occur would be a scarcity of service, that is a situation in which service is available but only for those willing and able to pay the price.

These concepts of shortage and scarcity apply to a free market situation implicit in which is the assumption that the public is willing to accept a scarcity without attempting corrective measures through government.

With the public already involved in providing dental services for certain segments of the population under Title XIX of the Social Security Act, it is unlikely that a scarcity will be allowed to develop without attempts at corrective action by government. It appears axiomatic in a democratic society that barring national disaster what once is given by government never is taken away. Yet, taking away dental and other health services might be the only fiscally feasible solution if costs of services are allowed to increase because of a scarcity of health manpower.

The choice faced by government boils down to two alternatives: (1) take action to assure adequate health manpower to prevent development of a scarcity, or (2) be prepared to impose controls on fees for health services.

A decision to impose controls on fees would of course prevent increases in costs for services and actually would prevent a scarcity of services, but it would do so by turning a scarcity into a shortage. That is, a situation would be brought about in which fees would be kept low enough so that demand from those willing and able to pay then would far surpass available supply.

As far as the public is concerned, the practical effect is the same whether there is a scarcity or a shortage of health manpower. The net result is a reduced availability of health services.

CONCLUSIONS AND RECOMMENDATIONS

Maryland citizens face an increasing scarcity of dental services because of a widening gap between professional resources and demand for services. Should current trends continue unaltered, by 1980 the dentist population will be sufficient at best to provide for only 50 percent to 60 percent of predicted demand.

Furthermore, all evidence points to a continued worsening of the situation beyond 1980 unless action is taken to alter existing trends. Specifically, action of two types seems indicated.

1. Increase actual and proportionate number of dentists.
2. Increase dentist productivity.

Increase Dentists

As a long range solution consideration should be given to constructing another dental school in the state and/or to markedly expanding the university dental school beyond the 25 percent currently planned. However, neither of these actions can be expected to result in an increase in practicing dentists unless a larger proportion of graduates is retained within the state.

The most probable way for bringing this about would be through a preferential dental school admission policy for Maryland residents. What the optimum proportion of Maryland residents and non-residents should be is a question for dental educators to decide for there are sound pedagogical reasons for not becoming completely parochial in student selection.

Should a second dental school be built it should be located in a university setting as a part of a health sciences complex. Should the university site selected not have a health sciences complex, development of such a complex in conjunction with the dental school would offer two advantages:

1. A health sciences complex contributes much to the academic environment of a university.
2. It would include the necessary supporting disciplines for a medical school when the time comes to build one.

Increase Dentist Productivity

Increased and more effective use of auxiliaries offers the greatest promise for increasing dentist productivity. Studies of relative productivity of dentists having various numbers of auxiliary personnel consistently show substantial increases in numbers of patients cared for as the size of the auxiliary staff becomes larger.

In relation to its ultimate objective, action taken to increase use of auxiliaries must be indirect because the number of auxiliaries a dentist employs is his own choice. Specifically two types of action appear indicated:

1. Include full time use of auxiliaries in all clinical training programs of the University Dental Schools.

2. Increase the numbers of schools training auxiliaries.

Through these actions an adequate supply of auxiliaries would be developed for a dentist population appreciative of their worth.

An even greater increase in productivity through use of auxiliary personnel could be realized through modification of Maryland Dental Law to permit auxiliaries to perform functions now prohibited. A resolution to support such modification throughout the nation has been adopted by the House of Delegates of the American Dental Association.

Recommendations for Further Studies

The limited time available for completing this study precluded investigating all relevant trends and conditions. Additional investigation therefore is recommended in the following areas:

1. Dentist busyness. How difficult is it to make a dental appointment in different parts of the state?

2. Dentist demand for auxiliaries. What types of auxiliaries will currently practicing dentists employ? Future dentists? What type and how comprehensive should auxiliary training be?

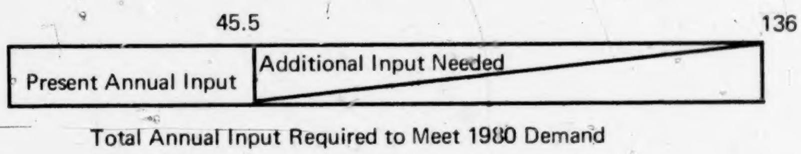
3. Appeal of dentistry as a profession? Why have so few Maryland residents entered dentistry? Has it been lack of applicants or of qualified applicants? Is the current increased application rate for admission to the University Dental School indicative of a trend?

4. Methods for delivering dental services – are partnership practices, those in which certain auxiliaries and facilities are shared, or group practices more productive than conventional solo practices?

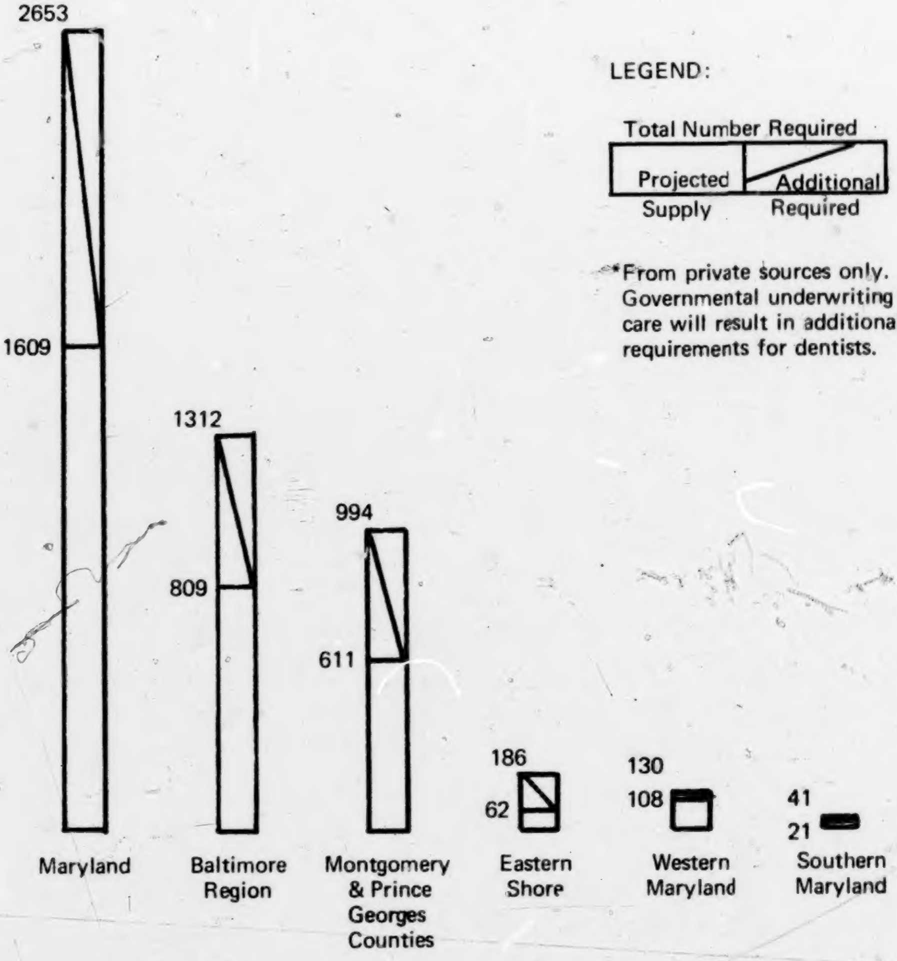
Finally we recommend a health manpower policy group be appointed to monitor developing situations. Predictions made by us are based upon our analysis of current trends and conditions found to be most relevant for the future, but unanticipated changes can occur at any time. Continued monitoring of developments will allow modifications to be made in plans and policies if and when indicated.

SUMMARY: REQUIREMENTS FOR DENTISTS MARYLAND, 1980

COMPARISON OF PRESENT ANNUAL INPUT OF NEW DENTISTS INTO PRACTICE IN MARYLAND WITH ANNUAL INPUT REQUIRED TO MEET PROJECTED 1980 DEMAND FOR DENTAL CARE.



DENTISTS NEEDED TO MEET PROBABLE DEMAND* FOR CARE, 1980



*From private sources only. Governmental underwriting of dental care will result in additional requirements for dentists.

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CHAPTER 5

ALLIED HEALTH PROFESSIONALS

Introduction

Satisfaction of the demand for health services depends on a complex of factors among which are the availability and productivity of the entire health team. The primary health professionals discussed in the foregoing chapters are usually assisted by one or more allied health professionals. The role of allied health professionals in the health industry is vital. However, classification of job categories is often ambiguous; data on numbers of workers unreliable; patterns of utilization and deployment obscure and the loose term "shortage" misleading, if not meaningless, in the absence of reliable data on utilization of personnel.

There are far fewer workers in the various categories of the allied health professions than there are nurses and doctors. Training for the allied health professionals is shorter and less costly than for doctors and dentists. Thus, for reasons of small numbers, less costly training, and most of all, lack of data, we have combined the Allied Health Professionals into one chapter.

The United States Public Health Service lists 37 health fields with 140 job titles and 175 alternative job titles or specialities. Obviously we could not include all in our report. Lack of inclusion, or brevity of presentation reflects limitations in data rather than value judgment as to the relative importance of one occupation over another in the spectrum of health carriers. The importance of allied health professionals in the aggregate is shown by the Department of Labor prediction that the health industry will be the nation's largest employer by 1970.

Sources of Information

Apart from census data available, statistics apply most exclusively to hospital personnel. The two hospital surveys (described in the chapter on Nursing) by the Hospital Council and AHA-PHS served as our primary sources.

Optometrist's, Pharmacist's and Physical Therapist's Associations provided us with useful data. The U.S. Public Health Service, Health Manpower Statistics Branch and Health Manpower Bureau as well as the Department of Labor supplied us with published and unpublished information.

PHARMACISTS

Introduction

We class pharmacists as health professions although much of their work is more commerce than health. The Bureau of Census includes only 7.1 percent of pharmacists in the health industry.[1] However, pharmacists are traditionally classed as members of the health team.

What will Maryland's demand for and the supply of pharmacists be in 1980? Much depends on technological change and the reaction of the profession and professional schools to this change.

The impact of pre-packaged drugs will undoubtedly alter the character of pharmacy practice, permitting increased productivity and possibly use of non-pharmacists to dispense medication. Increased productivity will tend to lower Maryland's requirements for pharmacists in 1980.

The development of new types of pharmacy personnel with different courses of training would call for changes in the pharmacy practice act and, more importantly, interest of the pharmacy schools in developing new courses. The training could prepare 1) dispensers – qualified to dispense pre-packaged medicines and carry out the retail business of the modern drug store and 2) professional pharmacists with sufficient training to meet the complex demands of the modern pharmaceutical industry and the modern hospital. We do not believe that changes in pharmacy training could have any real impact in Maryland before 1980. However, the University of Maryland Pharmacy School should prepare to adjust their training programs to meet the impact of technological change.

In 1980 Maryland will face neither a shortage nor a surplus of pharmacists. The basis and reasons for this prediction follow.

Present Demand for Pharmacists

Maryland's requirements for pharmacists will be determined primarily by two factors:

1. **The total number of prescriptions to be filled or refilled.**
2. **The number of pharmacies and the number of hours that they must be staffed.**

First, during 1967 an estimated 17,725,000 prescriptions will be dispensed in Maryland by 1,682 full-time or full-time equivalent pharmacists. This implies an average of 42 prescriptions per pharmacist per day, assuming 250 eight hour days per pharmacist, per year.

$$\frac{17{,}725{,}000 \text{ prescriptions}}{1682 \text{ pharmacists} \times 250 \text{ days}} = 42/\text{pharmacist}/\text{day}$$

With only 42 prescriptions per day there are definite possibilities for increasing productivity of pharmacists.

Using the second method of estimating demand, presently Maryland has approximately 790 community pharmacies. Assuming that most pharmacies operate 12 hours per weekday and 8 hours on Sunday, the weekly hours of operation total at least 80. Thus, each pharmacy requires at least two full-time pharmacists, a minimum state-wide requirement of some 1580 pharmacists plus those needed for hospitals.

Present Supply

As of January 1, 1967 actual number of pharmacists employed in community and hospital pharmacies in Maryland was 1,996, but all pharmacists were not employed full-time.

TABLE 5-1
TYPE OF PRACTICE OF RESIDENT PHARMACISTS IN PRACTICE, JANUARY 1, 1967

	Number of type of practice		
Resident Pharmacists in Practice	Community Pharmacy	Hospital Pharmacy	Other
MARYLAND			
2109	1922*	74	113

*1442 full-time + 480 part-time = 1682 full-time equivalents
(2 part-time = 1 full-time equivalent)

SOURCE: National Association of Boards of Pharmacy, 1967.

In terms of full-time equivalents, there were 1,682 pharmacists. Why all pharmacists are not employed full-time as pharmacists is not known. Part-time pharmacists may represent un-utilized potential supply in Maryland.

In addition to the 1,996 pharmacists employed in pharmacies, 113 pharmacists are employed in other areas related to pharmacy practice. The education, sex, and age distribution of pharmacists in Maryland is shown in Tables 2 and 3.

This age distribution clearly shows that there is no imbalance of pharmacists aging without replacement. The effect of aging leads to the next section.

Supply 1980

During the period 1962-1967 the number of pharmacists working in Maryland increased by a yearly net of 29 (net equals newly registered pharmacists in the state, less requirements, deaths, etc.). Projecting an increase

TABLE 5-2

SEX AND EDUCATION OF RESIDENT PHARMACISTS ENGAGED IN PRACTICE, JANUARY 1, 1967

Resident Pharmacists in Practice	Sex		%	Professional Education	
	Male	Female	Female	4 years	3 years
MARYLAND					
2109	1,946	163	7.7	1,549	460

TABLE 5-3

AGE DISTRIBUTION OF RESIDENT PHARMACISTS IN PRACTICE, JANUARY 1, 1967

	Number by Age (in Years)						Percent	
	Under 30	30–39	40–49	50–59	60–64	65 & over	Under 40	60& over
MARYLAND	419	661	446	437	87	59	51%	7%
UNITED STATES							42%	17%

at this rate to 1980, Maryland can expect to have a total of 2,486 resident pharmacists at that time.

Assuming that, as at present, 79 percent of resident pharmacists will be employed (full-time equivalents) in community and hospital pharmacies, the number so employed should be 1,963.

Projected 1980 Demand

First: If Maryland residents acquire prescriptions at the same rate in 1980 as they did in 1967, the number of prescriptions to be filled will be about 23 million, or 47 prescriptions per pharmacist per day which is only slightly more than the 42 per day figure for 1967. We believe that increases in productivity of pharmacists can easily meet the slight increase in demand over supply. Furthermore, we have assumed the same ratio of part-time to full-time pharmacists. These part-time pharmacists represent a safety factor that will balance possible increases in prescriptions per person per year.

Second: During the 13 years prior to 1967 the number of dispensing outlets in Maryland increased by 104. If outlets increase the same amount during the next 13 years, there will be 929 in 1980. In 1967, 95 percent of Maryland's dispensing outlets employed 2 or 3 pharmacists, 3 percent employed 4 or more pharmacists, and 2 percent employed 1 pharmacist. Applying these percentages to the 929 pharmacies projected for 1980, the number of pharmacists employed (part-time and full-time) will be 2,087 which nearly balances the 1963 pharmacists or full-time equivalent to be employed in pharmacies.

Distribution

In addition to balancing overall supply and demand, we must consider distribution within the state. We have not included the D.C. Metropolitan Area as it is clearly well supplied (85 community pharmacists/100,000 population compared to Maryland's 53/100,000). The fact that Montgomery and Prince Georges counties have fewer pharmacies than the average for the state is probably balanced by the relative abundance of pharmacies in Washington. Table 4 shows the distribution of pharmacies by region and county. As in most of the other good things of life, Southern Maryland is a deficit area. This again points up the need for overall regional planning and development for Southern Maryland.

Conclusions

It appears that if present trends continue, Maryland's supply of pharmacists should be adequate to meet its requirements in 1980. However, Maryland's supply of pharmacists comes primarily from out of state. Although the School of Pharmacy at the University of Maryland has a capacity of 80 students per class, recent classes have averaged fewer than 30 students. However, classes are now increasing in size (first year 63, second year 40, last year 36).

In light of the rate that out of state graduates have migrated to Maryland in the recent past, this low rate of output from the University is no cause for alarm. However, should rates of in-migration decline, a shortage of pharmacists could occur. The U.S. Department of Labor predicts a national shortage of 5,000 pharmacists by 1975[2], which would be expected to be at least 7,500 by 1980. This could affect Maryland's ability to attract pharmacists from other states.

As is the case in Maryland, a number of schools of pharmacy are operating at levels below capacity enrollment. The solution to any shortage which develops would be more effective recruitment of pharmacy students through courses designed to meet the dual needs for dispensers of pre-packaged medicine and for high level professional pharmacists.

TABLE 5-4

NUMBER OF PERSONS IN THE POPULATION PER PHARMACY, MARYLAND, JANUARY 1, 1967

Regions & Counties	Population (1000's)	Number of Pharmacists	Population per Pharmacy
WESTERN MARYLAND	302.0	57	5,299
Alegany	88.9	24	3,704
Frederick	85.0	14	6,071
Garrett	22.5	3	7,500
Washington	105.6	16	6,600
BALTIMORE REGION	1981.6	531	3,712
Anne Arundel	257.4	53	4,859
Baltimore City	926.5	298	3,110
Baltimore County	584.7	142	4,118
Carroll	62.3	12	5,190
Harford	99.6	18	5,533
Howard	51.1	8	6,390
SOUTHERN AREA	101.2	13	7,780
Calvert	19.0	1	19,000
Charles	39.3	7	5,613
Saint Mary's	42.9	5	8,580
WASHINGTON REGION	986.8	168	5,874
Montgomery	442.2	80	5,527
Prince George's	544.6	88	6,190
EASTERN SHORE	264.6	56	4,725
Caroline	20.9	3	6,700
Cecil	55.7	8	6,962
Dorchester	30.9	4	7,725
Kent	16.3	3	5,433
Queen Anne's	17.5	4	4,375
Somerset	20.0	5	4,000
Talbot	23.6	9	2,622
Wicomico	54.2	13	4,169
Worcester	25.5	7	3,643
MARYLAND	3,636.2	825	4,407

OPTOMETRISTS

Introduction

Many people confuse the terms optometrist, oculist, ophthalmologist, optician and orthoptist, for all of these professionals render some form of eye care. The *opthalmologist* or *oculist* is a physician who prescribes drugs and performs eye surgery as well as prescribing for glasses. The 170 ophthalmologists in Maryland are included in the chapter on doctors. *Opticians*, aided by optical technicians and lens grinders make and fit glasses on prescription of ophthalmologists or optometrists. The 360 opticians and optical technicians in Maryland are in the same proportion to population as the nationwide average. Most optician training is carried out on an apprentice basis after graduation from high school.

Optometrists examine eyes, prescribe lenses and other visual devices and utilize visual training exercises. (Visual training is also done by *orthoptists.)* The training for optometrists is six years beyond high school, leading to a Doctor of Optometry (O.D.). There is no optometry school in Maryland.

Present Demand and Supply

The present, effective economic demand for optometric services has been measured by the National Health Survey. The demand for services can be translated to demand for optometrists by use of an average productivity factor. National Health Survey data show that 8.7 percent of the U.S. population make 1.4 visits to optometrists per year (.12 visits per capita per year). Age distribution and economic level in Maryland are close enough to the national average to make the use of national figures appropriate. There were 470,000 visits to optometrists in Maryland in 1967. With the present supply of 209 optometrists, theoretically equal distribution, and a 250 work day year, each optometrist met an average demand for 8.9 visits per day.

Table 5 shows the present supply by region and demand is expressed in terms of (1) population per optometrist and (2) average visits per optometrist per day. The P.H.S. states that, on the average, one optometrist should serve 15,000 people. By this criterion, Maryland has minor shortages today. However, in terms of visits per day the state does not appear to have any great need for more optometrists, although there are regional imbalances.

Productivity

The present productivity of only 8.9 patients per day seems very low. In the past, professional estimates have run as high as 1-1/2 hours per new case. However, schools of optometry are now recommending the scheduling of two patients per hour (16 per day). Army installations schedule as many as four patients per hour, per optometrist, with appropriate use of assistants. Productivity of optometrists could and should be increased.

Supply of Optometrists: 1980

There are no training facilities for optometrists in Maryland, therefore the state depends upon in-migration of graduates from the 10 U.S. schools of

TABLE 5-5

SUPPLY-DEMAND OPTOMETRISTS BY REGION, 1967

Region	Supply of Optometrists	Population per Optometrist	Average visits per optometrist per day
Western Maryland	21	13,614	6.8
Baltimore Region	125	16,373	8.2
Southern Maryland	1	106,900	- - -[1]
Prince Georges & Montgomery	46	20,215	10.2[2]
Eastern Shore	16	16,419	8.3
TOTAL	209	17,712	8.9
D.C.	82	10,200	5.1[2]

[1] Visits per day meaningless - many residents go to Washington

[2] Prince Georges and Montgomery Counties should be considered together with Washington.

optometry. There is no reason to expect the present rates of supply to change significantly. In the five year period from 1962-1967 there was a net gain of 14 optometrists. By rough estimate, this trend would give a total of 240 optometrists by 1980.

It should be noted that there was an increase of 30 practicing ophthalmologists in Maryland from 1963-1966. The projected increase of 130 new ophthalmologists by 1980 might have a marked effect in decreasing demand for optometrists.

Demand for Optometrists: 1980

If the ratio of one optometrist per 15,000 population were realistic, Maryland would need 312 optometrists for the 1980 population.

The actual demand for services per capita will increase slightly because of increasing family income.

The decrease in proportion of high demand age groups by 1980 will tend to lower demand, but not enough to change overall estimates.

If today's low rates of productivity, (8.9 patients per day) prevail, 290 optometrists would be demanded in 1980 to serve the projected population. However, we feel productivity should increase. The projected supply of 240

TABLE 5-6

1980 DEMAND PER CAPITA

Income	Population (1000's)	% with visits to optometrists (present rates)	Number of patients (1000's)	Total visits @ 1.4/pt. (1000's)
$0–4,999	748	7.6	57	80
5,000–9,999	1,777	8.9	158	222
10,000 +	2,152	11.2	241	337
TOTAL	4,679	---	456	639

optometrists could meet the projected demand for services if optometrists saw an average of 10.7 patients per day.

Recommendations and Conclusions

There appears to be no shortage of optometrists in Maryland at present. Any increase in demand should be met by increased productivity.

OSTEOPATHS

There are less than 20 osteopaths in Maryland today, fewer per 100,000 population than the national average. In the United States, 5 osteopathic colleges graduated 395 students in 1965. The new state licensing law may increase the number of osteopaths, but they must take a rigorous licensing examination, comparable to the medical licensure examination. The nation will probably follow the lead of California and absorb osteopaths into the medical establishment.

PODIATRISTS

In 1964 there were seventy-eight podiatrists (chiropodists) in Maryland. These workers treat and examine feet and prescribe foot care. Training requires four years in podiatry school after two years of college. Maryland's ratio of 2.1 podiatrists per 100,000 is less than half that for the United States at large. This probably reflects the lack of demand for podiatrists in the State of Maryland.

In 1966, there were 112 podiatry graduates from the 5 U.S. schools. There are no podiatry schools in Maryland.

PSYCHOLOGISTS

Only one-third of all psychologists in the United States are primarily concerned with health. In Maryland, 153 psychologists were in the health field in 1965. The majority (106) were clinical psychologists working in hospitals, clinics, etc. Others worked in the fields of guidance and counselling, social psychology and psychological measurement. There were 387 psychology graduates in the United States in 1964. Training for psychologists now ranges from one to two years of graduate study to a four year Ph.D. program followed by one year of internship.

The Johns Hopkins University does not attempt to train applied workers in any field of psychology. Students with a B.A. may acquire an M.A. in Clinical Psychology or accumulate the equivalent of an M.A. and proceed to a Ph.D. The degree is granted on the basis of completion of an individual program of research.

The University of Maryland (College Park) will graduate about ten psychologists per year for the next decade.

Without an increase of psychology graduates, or considerable in-migration, Maryland may face a shortage of psychologists.

SPEECH PATHOLOGY AND AUDIOLOGY

Speech pathologists and audiologists help to diagnose and treat speech and hearing disorders. Frequently, they work in conjunction with physicians. Nationally, there are some 12,000 members of the American Speech and Hearing Association; about 10,000 are active. In addition, there are probably 4,000 active audiologists who are not members of the Association. The majority of audiologists are employed in schools or colleges, the rest working in hospitals and rehabilitation centers.

Having 314 members of the Association in 1965, Maryland was relatively well supplied with audiologists. The reason may rest in Maryland's having four schools for audiology and speech training; two of the four doctoral programs in audiology in the United States are in Maryland. We see no indication for an increase in audiology and speech pathology training facilities within Maryland at present.

CHIROPRACTORS, NATUROPATHS AND OTHERS

There are 184 chiropractors in Maryland. National Health Survey data show that chiropractors are visited by the poor, the old, and the uneducated. There are 40 percent more visits per capita for persons with less than 9th grade education than for persons with over 13 years of schooling. If the figures provided by the International Chiropractors Association are correct, chiropractors have extremely low productivity, seeing less than four patients per day on the average. This may be an underestimate of productivity resulting from an overestimate of the number of chiropractors.

There are few naturopaths in Maryland. One is listed in the yellow pages of suburban D.C., none in Baltimore.

Since the population in Maryland will tend to become wealthier and better educated, we assume that the demand for health cultists will decline by 1980.

ENVIRONMENTAL HEALTH MANPOWER*

Environmental health problems are increasing in complexity at a rate outstripping the capability of existing or projected environmental health manpower for solving them.

This increasing disparity between requirements and capabilities is one not simply of quantity, but also of quality. Problems faced are not only those of providing more services for a growing population, but also those of developing new types of services to meet requirements generated by technological development.

Because of ever larger numbers of people living in growing and increasingly complex urban areas, problems faced are multidimensional requiring multidisciplinary solutions; and because of the tendency of growing urban areas to coalesce into a megalopolis, solutions require multijurisdictional approaches.

Currently, shortages and deficiencies exist in both personnel and programs. There is no evidence of the planning needed for future correction. The first corrective step necessary is the education and training of adequate numbers of environmental health personnel having capabilities for–

1. **Planning and developing preventive and control programs.**
2. **Implementing and carrying out such programs.**
3. **Anticipating–**
    - a. **The nature and magnitude of future problems, and**
    - b. **Types and numbers of personnel needed to solve these problems.**
4. **Developing methodologies appropriate for solving the new and complex environmental problems.**

Although environmental health problems depend more and more on multijurisdictional approaches for their solution, primary responsibility for educating and training needed personnel remains with the individual states.

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*by Robert Jones, B.S.P.H.E., M.P.H., P.E., Engineer Director USPHS, on detail to analyze Problems of Environmental Health Manpower.

Supply

In consideration of the serious threat to the public's health posed by environmental contaminants, the number of persons engaged in environmental health activities is surprisingly small. National statistics show in 1961 that of a total scientific manpower pool totaling 1,400,000, only about 28,000 were engaged in environmental health activities. Projected output of environmental health manpower through 1970 would increase this number to only about 2.6 percent of total scientific manpower. On a national basis estimated numbers of persons employed in environmental health occupations are as follows:

Occupation	Estimated Number
Environmental Health Engineers	8,000-9,000
Sanitarians & Sanitary Technicians	15,000
Environmental Health Scientists	2,500-3,000
Environmental Health Specialists	7,000-8,000
Engineering Aides	Unknown
Environmental Health Technicians	Unknown

Maryland had 154 sanitary engineers and 218 sanitarians. For sanitarians this gives a Maryland rate of 100,000 population of 6.8 as contrasted with a national average of 5.7 per 100,000.

A questionnaire completed by 160 of the 218 sanitarians shows that 59 had graduated from the University of Maryland, 59 from other schools and 42 were non-graduates. In terms of education of sanitarians completing the questionnaire about two-thirds were college graduates and one in six held an advanced degree.

Among these sanitarians there was wide variety of under-graduate educational majors reported:

27% - agriculture

[illegible]5% - biological sciences

[illegible]% - public health veterinary medicine

[illegible] - physical and earth sciences

[illegible] sanitary science

The sanitary engineers are trained at University of Maryland and Johns Hopkins. There is no undergraduate training of sanitarians, but a post-graduate program has been proposed at the University of Maryland Agriculture School. It appears premature to consider establishing a graduate sanitarian program at the College of Agriculture before an "in-depth" analysis of the environmental health manpower situation in Maryland is completed.

While simply increasing the output of personnel educated and trained for presently organized environmental health occupations would be beneficial, this does not appear to be the optimum solution. Rational planning for types and numbers of personnel to be educated cannot be carried out until the following questions are answered:

1. **What are the types and volumes of services that organized society will demand for environmental health protection in the future?**
2. **What are the capabilities of different occupational groups in the environmental health field to meet these demands? What should these capabilities be?**
3. **To what extent could or should capabilities of the different occupational groups be expanded with, or without, additional training?**
4. **Which occupational groups are best prepared to accept responsibility for solving anticipated new problems? What new types of occupational groups are needed?**
5. **How can present and future educational and training facilities for environmental health personnel best fulfill their obligations for the public good?**

Answering these questions is a responsibility not only of environmental health workers and educators, but also of policy makers. Answers to these questions directly concern the public.

Until these and other pertinent questions relative to environmental health problems and solutions are answered, definitive recommendations cannot be made; *therefore we recommend as a necessary intermediate step that appropriate studies be carried out to provide the needed answers.* The Maryland Council on Higher Education should follow with concern the study of environmental health manpower just initiated in Maryland.

This environmental health manpower study may be viewed as a "spin off" benefit from the Council's interest and support of general health manpower planning.

HOSPITAL PERSONNEL

This section covers those allied health workers who primarily are employed by hospitals and other institutions. The separation is arbitrary, for some of the psychologists, audiologists, etc. discussed above, work in hospitals and some of the technicians and other members discussed in this section work outside hospitals. The division is functional, however, as projections for demand in this section are based primarily on expected increases of hospital beds.

Demand

Demand for health services basically depends on: rates of disability and disease; perception of disease and need for prevention by individuals; expectations of benefits from medical care; ability to pay for care (either private or governmental); accessibility and availability of service, and accepted patterns of staffing and systems for delivery of medical care.

In the past most studies of demand for health workers have been based primarily upon the ratio of professionals to population. There are many limitations to this method of analysis; not the least is perpetuation of the status quo. For most allied health professions, the numbers actively employed relative to the population are so small as to make ratios unreliable. In spite of these limitations, the number of people per capita employed in ancillary health professions in Maryland at present is a crude but workable index of demand.

For hospital personnel, staff to bed ratios are more useful than gross population ratios in calculating future demand. For our projections we have used both.

The Maryland Hospital Council, and Public Health Service - American Hospital Association provided the baseline data for estimating present and future demand for hospital personnel. This data came from separate but coincident surveys in the spring of 1966. The Maryland Hospital Council survey made a useful distinction between number employed and number of budgeted vacancies by job category. The Public Health Service study provided more detailed data permitting estimates of demand weighted by type of hospital, (short-term, long-term, psychiatric, and federal).

Major differences in results of the two studies point up the need for knowledgeable evaluation of any health manpower data. Even after differences in the classification of personnel, methods of part-time to full-time conversion, and corrections for incomplete reporting have been reconciled there are still discrepancies between the two studies in numbers of reported employees. Seasonal differences in employment, the terminology of the survey forms, and the interval of four months between collection of data for the two surveys may account for some differences; a compromise figure is probably a reasonable index of the current magnitude of hospital employment for these categories.

Projected percentage increases in hospital beds to 1980 are different for each type of hospital, so the final demand estimate is differentially adjusted for all hospitals in each category. Percentage increase in hospital beds from 1967 to 1980 was used as the projection ratio for number of hospital personnel demanded (those employed plus budgeted vacancies) in each job category in 1980.

For professionals such as x-ray technologists where many work outside hospitals, we added appropriate corrections to make up the total 1980 demand.

We emphasize the approximate nature of our method. However, we have no empirical base from which to estimate aggregate effects of changes in patterns of utilization and deployment of personnel and of the organization and delivery of services upon total demand for hospital personnel. We caution the reader that the degree to which projections approximate reality tends to decrease the greater their distance in time from today.

Supply

Multiple forces determine future supply of health manpower, including: recruitment and selection for entry into training programs; attrition rates in training programs; licensure; post-training attrition rates; movement to inactive status; outmobility to other professions; death; retirement and death rates; rate of re-recruitment of inactive workers; net migration in and out of state.

The increasing proportion of the population in age group 15-24 (the age for initial health career recruitment), the increasing numbers of college and high school graduates, and the declining proportion of students recruited into the teaching profession, suggest that the resource pool for health professionals will increase in Maryland.

With few exceptions the training programs for allied health professionals in Maryland do not function at capacity enrollment; the argument for more training programs is not persuasive, except for those job classifications currently without training facilities in Maryland. The increasing participation of women in the labor force may encourage re-recruitment, and decrease overall attrition of hospital personnel.

In measuring supply of manpower in selected occupations we considered the increment of graduates and made a rough estimate of net increments and decrement rates for post-training attrition, retirement, recruitment of inactive workers, and net migration. In point of fact, scarcity of data on recruitment, attrition and retention of trainees and personnel make projections of supply arbitrary.

Administrators

The chief demand for health administrators comes from hospitals of Maryland. The term administrator applies to highly skilled professionals responsible for the operations of multimillion dollar hospital complexes, to workers (possibly without any formal training) responsible for small nursing homes. Administrators may have a basic professional discipline in medicine or nursing, may be professionally trained hospital administrators, or may be "experts by assignment".

On a nationwide basis, it is estimated that there were 32,000 to 37,000 administrators employed in the health services: from 10,000 to 12,000 in hospitals, similar numbers in nursing homes and other extended care facilities, about 8,000 in voluntary health agencies and about 3,000 in public health programs.

We assume that each of the 86 hospitals in Maryland employs at least one administrator. Naturally, the larger hospitals have more. In fact, the teaching hospitals have hospital administration residents assigned to them for training.

Projection from national figures to Maryland would be hazardous, particularly in the case of public health and voluntary agencies where many of the administrators are employed at the national level. There was little information available to us on medical administrators in Maryland.

There were 280 hospital administration graduates from the 21 schools in the United States in 1965. Maryland does not have a hospital administration school, although in the early 50's there was a program at Johns Hopkins University.

In view of the increasing complexity and rapid growth of both hospital and non-hospital health services, Maryland will undoubtedly need more health administrators. Some of these administrators should have health professional backgrounds; others should have basic training in business administration. All should have specialized training in business administration. All should have specialized training and experience in the unique problems of health care administration. Because of lack of data, we cannot make precise recommendations as to either the type of education or numbers to be trained. However, we believe that plans should be initiated for establishment of appropriate training facilities in Maryland. Planning should involve the Maryland Hospital Council, representatives of the Nursing Home Association, State and City Health Departments, and Voluntary Agencies as representatives of the employers of health administrators. Educators in the field of business, public health administration, medical care administration, and hospital administration should also be involved in planning.

Laboratory Personnel

There are over 85,000 laboratory workers in the health industry in the United States. Of these, some 40,000-50,000 are employed in hospitals, 25,000-30,000 in doctors' offices, some 10,000 in private laboratories and 4,000 in the health departments of the nation. Approximately 40 percent are college graduates and about 4 percent have graduate degrees. Thirty-five thousand persons are registered as Medical Technologists by the American Society of Clinical Pathologists or have appropriate degrees in medical technology. There are some 45,000 to 50,000 laboratory technicians or assistants, whose training ranges from purely on the job training to one year of formal training.

In Maryland, there are some 1000 certified or graduate laboratory technologists and about 400 laboratory technicians and assistants in the hospitals. Budgeted vacancies for these two professions run from 10 to 15 percent. Hospitals' assessments of desired staffing needs are somewhat higher. Extrapolating from national figures we estimate as many as 100 certified technologists and 209 technicians and assistants working in doctors' offices and private laboratories in Maryland. Maryland's excellent state laboratory system also employs 145 laboratory technicians and technologists.

In addition to laboratory technicians there are small numbers of cyto-technicians (60) and histo-technologists or histo-technicians (110) in Maryland.

At the present time, Maryland has six schools of medical technology. The most recent figure for graduations was thirty-five per year. There is a new school at the University of Maryland combining work at College Park and the Baltimore Medical Campus. Thirty graduates per year are expected by 1970. Two courses for cyto-technologists graduate small numbers. Two schools for laboratory assistants had 14 graduates in the most recent year of record.

On the basis of shaky evidence, we surmise that the demand for laboratory technicians and technologists will probably outstrip the supply by 1980, despite the output of the new school at the University of Maryland. Probably increased capacity of existing training programs is indicated.

We recommend that the state consider uniform licensing and registration for laboratory technologists and technicians for two reasons. The state could exercise some surveillance over the quality of registrants, and registration data would be useful for predicting trends and planning the educational system to avoid either over or under-production.

Medical Records

The increasing importance and complexity of systems of medical records within both hospital and non-hospital facilities lends importance to this small group of health professionals. Currently in Maryland there are 61-86 medical record librarians and 145-271 medical records technicians with additional budgeted vacancies. Maryland has two schools - one for medical records technicians at Sinai Hospital has recently phased out and is relocating at Baltimore Junior College and one for medical record librarians at the USPHS hospital. The medical record librarians require a B.A. degree plus fifty weeks of special training.

We do not anticipate the need for new programs in Maryland. Expansion of existing programs may be appropriate.

Occupational Therapists

There are approximately 190 occupational therapists in Maryland. 80-100 are employed in hospitals (aided by 100 occupational therapist assistants), some 50 may be inactive, and others are employed in other institutions. There are 22 budgeted vacancies in the hospitals of Maryland indicating either a shortage of occupational therapists or insufficient salaries to attract inactive therapists back to the work force.

In 1965, 550 students graduated from the 32 schools of occupational therapy in the U.S. There are no accredited courses for occupational therapists in Maryland, although the Maryland State Health Department has an interesting training program for occupational therapy assistants. With the rate of training presently carried out in other states, we do not believe a school of occupational therapy is indicated for Maryland on the basis of projected demands. However since occupational therapy is currently changing rapidly in patterns of service and delivery of service, we believe an innovative experimental training program may be indicated in Maryland.

Radiology

It is estimated that over 70,000 x-ray technologists and technicians work in the United States. Some 41,000 of these are recognized by the American Registry of Radiologic Technologists. Of the 41,000 about two-thirds are active. Nationally, only about one-fourth of x-ray technologists work in hospitals. In Maryland, some 670 technologists are registered by the National Registry, of these some 200 are inactive. Probably an additional 200-300 are working, but not registered. Data from the hospital survey shows that 350-450 x-ray technologists are working in hospitals in Maryland and 100 x-ray assistants.

In addition to diagnostic x-ray technologists there are small numbers of nuclear medicine and radiation therapy technologists. Maryland has approximately 30 of these working in hospitals.

Fourteen schools in Maryland train x-ray technologists. One hundred and sixteen students graduated in 1965.

Rough estimates indicate that the hospital and non-hospital demands for x-ray technologists will approximately match the projected supply in 1980. We do not feel more schools are needed, however, there is room for expansion in the existing schools.

Physical Therapists

Physical therapists evaluate patients referred by a physician, plan and supervise, if not administer a program designed to restore functions and prevent disability following disease, injury, or loss of a body part.

Some 250 physical therapists work in Maryland. Fifty more are known to be inactive. Hospitals employ over 100. From 40-70 are estimated to be in private practice. Fifty work in doctors' offices, teaching, or in other agencies. Employment of the remainder is not known.

The University of Maryland's physical therapy course could yield an average of 25 graduates from 1967-1980. With an average entering class of 45 this would represent a 45 percent school dropout rate. The 50 percent professional attrition rate for ten years after schooling would give a net addition of 150 graduates by 1980. In-migrant physical therapists corrected for attrition would add 250 by 1980. The additions, plus the present work force corrected for attrition would result in a minimum of 550 working physical therapists in Maryland by 1980.

Based on population increase, the present ratios of physical therapists to population, the projected 1980 demand is 380 physical therapists working in Maryland. The expected increase in supply by 1980 would increase the ratio of physical therapists per 100,000 population by 45 percent.

If a training program for physical therapy assistants is initiated, physical therapists could devote more time to planning and supervision, and the costs of provision of physical therapy services might go down, but there might be some risk of underemployment of fully trained physical therapists.

Even if we have underestimated increases in extended care and rehabilitative services, no new training programs in physical therapy are indicated.

Dietitians and Nutritionists

Two-thirds of the 30,000 dietitians and nutritionists employed in the United States work in the health industry. Dietitians assume major responsibility for management of food services. Nutritionists (less than 1000 in the U.S.) investigate and solve problems of nutrition. In 1960, 448 dietitians and nutritionists were located in Maryland. Of these 258 were members of the American Dietetic Association. The 1966 USPHS Hospital Survey showed 200 dietitians were employed in hospitals and clinics.

In 1967 the University of Maryland offered a degree in foods and nutrition, institution management and administration, and in nutrition.

In 1964 two B.A. degrees and seven M.A.'s in foods and nutrition were conferred.

Morgan State and Hood College have programs for the training of dieticians Morgan graduated two students in 1965 and Hood College graduated three in 1965 with a capacity for six students.

At present there are no approved dietetic internship programs in Maryland; nor do any schools in Maryland offer M.A.'s in public health nutrition. However, in 1963-1964, in the United States, 690 B.A.'s, 123 M.A.'s, and 10 Ph.D.'s were conferred in foods and nutrition.

The Maryland Hospital Council Survey of 1966 found three hospitals in the state indicating a shortage of dietitians. We see no new programs indicated, however. Expansion of existing programs should solve any inbalance in supply and demand.

Medical Secretaries

Sixty-nine percent of all secretaries employed in the United States work in the health industry; in professional offices and health institutions. They schedule and receive patients, set out instruments and perform other varied functions, although their duties are primarily clerical. They are not to be confused with receptionists, office nurses, or laboratory assistants, although in small offices one assistant may assume many functions.

Both Baltimore Junior College and Villa Julie have programs for training medical secretaries. In 1965 Baltimore Junior College graduated seven and Villa Julie twenty-six students.

The demand for medical secretaries is undoubtedly great, however, we have no data on the magnitude of total demand for doctor's offices. The Maryland Hospital Council found 341 medical secretaries employed in hospitals; 44 budgeted vacancies were declared (11.4%).

To meet future demand to 1980 for medical secretaries, secretarial schools and colleges for high school students and graduates should be encouraged to increase their capacity or inaugurate programs for medical secretaries.

Medical Social Workers

10.3 percent of all social and welfare workers (exclusive of group social workers) are employed in the health services. Medical and psychiatric social workers are involved directly with patients and their families, helping them to cope with the problems of illness, recovery and rehabilitation in 1966. One hundred and eighty to three hundred and forty social workers with a master's degree and seventy with no degree were employed in the hospitals of Maryland with budgeted vacancies of fifty-one (22.1%) and eleven (13.5%) respectively. The Hospital Council does not list them in the category of acute need or shortage.

The University of Maryland offers a Master's degree in social work; in 1965 112 students were enrolled and 28 graduated. Essex Community College inaugurated a program for social work assistants in 1966. No data on enrollment capacity or graduates was available.

Should the demand for medical social workers increase, there are two alternatives.

1. Increase the enrollment in the University of Maryland's M.A. program.
2. Inaugurate a post-graduate course designed for non-medical social workers, recruit social workers from in and out of state and train them for health services.

Electroencephalograph Technicians

These technicians are usually employed in the neurology services of large hospitals although some may work in neurologists' offices. On-the-job training with a three to six month apprenticeship is the usual course of preparation. High school graduation and an aptitude for sophisticated technical work is necessary.

The Johns Hopkins Hospital has an informal program of about six month's duration. High school graduation is required and an additional two years of college is preferred.

Twenty-four EEG technicians are employed in hospitals in Maryland with five budgeted vacancies (17.2%). At present the demand is adequately met by on-the-job training; no formal programs are indicated.

Electrocardiograph Technicians

Electrocardiograph technicians are employed in the cardiology service of a hospital or in private practice. No specific formal education is required although high school graduation and some college work are desirable. On-the-job training lasts from three to six months. One hospital in Maryland has an in-service training program. Eighty-two to one hundred and ten EKG technicians are employed in the hospitals of Maryland with eight budgeted vacancies. (9.0%)

RECOMMENDATIONS AND CONCLUSIONS

A. **Data on the Allied Health Professions is of poor quality or non-existent.**

Recommendation 1:

A continuing survey and evaluation of allied health manpower should be carried out by an appropriate agency of the state.

Recommendation 2:

The state should improve licensing, registration and re-registration procedures for the allied health professions to provide data necessary for allied health professions educational planning.

B. **The severest shortage in 1980 will be medical laboratory technologists.**

Recommendation 3:

Present programs should be expanded to provide additional graduates or new programs should be initiated.

C. **Adequate information on the need for and utilization of environmental sanitation personnel in Maryland is not available.**

Recommendation 4:

Decisions on educational programs for environmental sanitation personnel should be deferred until the ongoing study on utilization of environmental sanitation personnel is completed.

D. **Physician productivity could be increased without sacrificing the quality of care through use of specially trained office assistants.**

Recommendation 5:

Appropriate curriculum should be developed and experimental training programs initiated to train physical assistants to assume appropriate work in doctor's offices, to permit more effective utilization of the doctor's time.

TABLE 5-8

1967-1980 SUPPLY, 1980 DEMAND - ALLIED HEALTH PROFESSIONS

	1967		1980	
	Est.[1] Total Employed	Average # Graduates Expected Per Year	Expected Work Force[3]	Projected Demand
Medical Lab. Technologists	1,100	61	1,200	1350-1550
Laboratory Technicians	500	66	900	750
X-ray Technicians, Technologists	1,000	74	1,300	1200-1300
Medical Records Librarians	90	4	100	100
Medical Records Technicians	240	14	300	200-350
Medical Social Workers	290	10	300	400-500
Dieticians	190	7	250	250-300
Physical Therapists[2]	250	25	500	350-400

[1] Total persons AHA-PHS Hospital Survey - 10% correction + estimated employed non-hospital.

[2] Separate projections based on information from P.T. Association.

[3] 1967 total employed, plus estimated graduates per year less 4% annual attrition (to nearest 50) Net migration assumed = zero.

TABLE 5-7

ALLIED HEALTH PROFESSIONS, 1967 DEMAND PROJECTED TO 1980

	1967 Number Employed		Unmet Need		1980 Demand		
	Hospital Council[1]	PHS–AHA[2]	Budgeted Vacancies	Stated Need	Hospital Personnel[3]	Non-Hospital	Total
Medical Technologists	610	1090	100	250	1350–1550	150	1500–1700
Lab. Technicians & Assistants	390	340	50	70	450	300	750
X-ray Technicians & Technologists	350	450	30	100	550–600	700	1200–1300
Medical Records Librarians	60	90	20	20	100	--	100
Medical Records Technicians	150	270	10	50	300–350	--	300–350
Medical Social Worker	180	320	50	110	400–500	--	--
Dieticians	150	210	20	70	250–300	--	--
Physical Therapists	120	130	20	50	150–200	100	250–300

1967 rounded to neares ten, 1980 to nearest ten.

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[1] Full-time equivalents

[2] Total persons, estimated from partial returns - on overestimate compared to Hospital Council results

[3] Total persons working plus unmet need 1967, corrected for an overestimate, expanded to match hospital beds and/or population increase. (A-based on budgeted vacancies, B-on stated needs)

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APPENDICES

APPENDIX I.

APPENDIX II.

APPENDIX III.

APPENDIX I

EDUCATIONAL OPPORTUNITIES IN THE HEALTH PROFESSIONS FOR NEGROES IN THE STATE OF MARYLAND

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Victor H. Dates**

NOTE: *To be published later in journal form - please do not quote without author's permission.*

Introduction

The critical shortage of health manpower in the United States could be significantly improved by a more deliberate exploitation of the present wasted talent of Negro Americans. This study relates specifically to the situation in the fields of medicine, dentistry and nursing.

At a time when the United States is largely dependent on foreign medical graduates, only 2 percent of physicians, 2.7 percent of dentists and 5.7 percent of professional nurses are Negro,[1] but Negroes form 10.5 percent of the total population. The majority of these health professionals are trained at predominantly Negro schools. In fact, the percentage of Negro students studying at predominantly white medical schools was decreased from 31 percent of the 761 Negro students in 1955-56 to 24 percent of the 715 students in 1963-64.[2, 3] Since 1954, Negro applicants have become eligible for entry into many more nursing schools, but the percentage of Negro students in professional schools of nursing dropped from 3.2 percent in 1951 to 3.0 percent in 1963.[4] The fact that during the interval there were ten less of the predominantly Negro nursing schools apparently had a greater effect on Negro student admissions than the Supreme Court decision of 1954.

It is true that Negroes are over-represented in the lower categories of health personnel, but this does not compensate for the marked under-representation in the professional categories. Improvement can occur only when there are increased educational opportunities for Negroes.

Objectives

The main objective of this study was to determine what opportunities existed within the state of Maryland for Negroes to pursue training in medicine, dentistry and nursing and to compare the opportunities for white and Negro students. It is recognized that opportunities which are available in the Washington, D.C. area and in other states may influence the provision of opportunities within the state and may even affect one group more than the other. On the other hand, it is reasonable to expect that in addition to the use of available opportunities across borders, each state would provide equal opportunities for students within its own borders. A study of the problem in this state may have some relevance to the entire country. At the time of the 1960 census, 16.7 percent of the population of the state was Negro. The city of Baltimore has most of the institutions for training in the health professions. In this city it is estimated that about 40 percent of the population is Negro, and for the population under 21 the percentage is even higher. In many respects it is similar to other great metropolitan areas of the United States.

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Method

The investigation was conducted by mail and in some cases by personal interview with deans or directors. All institutions were asked to give information on the total number of students enrolled in the graduating classes for each of five years, 1965-69. They were also asked to classify these students with respect to race and place or origin, including Baltimore City, counties in Maryland, other states and foreign countries. Most institutions replied by mail; the few remaining were reached by telephone.

Findings

Medicine. There are two medical schools in the state of Maryland, The Johns Hopkins University and the University of Maryland. The Johns Hopkins University has had two Negro students in the medical school during the five-year interval, one of which was a Negro American. He was not from the state of Maryland. During that interval, then, no Negro from the state of Maryland received undergraduate training from this school of medicine. During the same interval there were 50 white students from the state of Maryland. There were also ten foreign students enrolled.

At the University of Maryland School of Medicine there were 13 Negro students admitted to the classes of '65 to '69. All except one were from Baltimore. The proportion of Negro students in the school is approximately 2 percent.

More than two-thirds of the students enrolled at the University of Maryland are from within the state, whereas only about one-eighth of the students enrolled at Johns Hopkins were from within the state.

Dentistry. The dental school at the University of Maryland is the only dental school in the state. Despite a non-discriminatory policy by the institution, it has had no Negro students during the five-year interval.

Nursing. There are three types of nursing programs offered in this state: the baccalaureate, the associate degree and the diploma programs. There are Negro students in all of these programs but the proportion is quite small. The number of students enrolled during the period of study is given in Table 1.

In the baccalaureate program 2.3 percent were Negro. In the associate degree and diploma programs 4.6 percent were Negro. For the state of Maryland the percentage of Negro students in both the baccalaureate and

TABLE I

STUDENT ENROLLMENT IN NURSING SCHOOLS BY TYPE OF PROGRAM AND RACE

Name of School	Total	No. of Years	Annual Average	Total White	Total Negro	Ave. White	Ave. Negro	Foreign
Baccalaureate Program								
Columbia Union College	159	5	31.8	144	10	28.8	2.0	5
St. Joseph's College	185	5	37.0	184	0	36.8	0.0	1
University of Maryland*	312	3	104.0	306	6	102.0	2.0	0
Associate Degree Program								
Anne Arundel Com. College+	-	-	-	-	-	-	-	-
Baltimore Junior College	35	2	17.5	31	4	15.5	2.0	0
Catonsville Com. College	68	2	34.0	66	2	33.0	1.0	0
Harford Junior College	15	1	15.0	15	0	15.0	0.0	0
Montgomery Junior College	41	2	20.5	39	2	19.5	1.0	0
Diploma Program								
Bon Secours Hospital	95	3	31.7	95	0	31.7	0.0	0
Church Home and Hospital	245	5	49.0	242	1	48.4	0.2	2
Franklin Square Hospital	51	3	17.0	47	4	15.7	1.3	0
Frederick Memorial Hospital	79	4	19.8	79	0	19.8	0.0	0
Helene Fuld School of Nursing	135	5	27.0	0	133	0.0	26.6	2
Johns Hopkins Hospital	577	5	115.4	573	4	114.6	0.8	0
Lutheran Hospital	111	5	22.2	110	1	22.0	0.2	0
Maryland General Hospital	254	5	50.8	252	1	50.4	0.2	1
Memorial Hospital—Cumberland	90	3	30.0	90	0	30.0	0.0	0
Memorial Hospital—Easton	53	3	17.7	53	0	17.7	0.0	0
Mercy Hospital	298	5	59.6	297	1	59.4	0.2	0
Peninsula Hospital	53	3	17.8	53	0	17.8	0.0	0
Sinai Hospital	292	5	58.4	285	5	57.0	1.0	2
St. Agnes Hospital	300	5	60.0	296	4	59.2	0.8	0
St. Joseph's Hospital	168	5	33.6	164	4	32.8	0.8	0
Union Memorial Hospital	354	5	70.8	351	1	70.2	0.2	2
Washington County Hospital	89	5	17.8	89	0	17.8	0.0	0

* Does not include Walter Reed program.

+ Data not available.

associate degree programs is lower and that of the diploma program higher than the national figures for the year 1962-63 reported by Tate and Carnegie.[4]

The University of Maryland, Columbia Union College, and Baltimore Junior College had an average of two Negro students per year. The only diploma schools which had an average of one or more Negro students per year were the Franklin Square Hospital, Sinai Hospital and, of course, the Helene Fuld School of Nursing which is predominantly Negro. Eighty percent of the Negro nurses trained in the diploma programs within the state are trained at the Helene Fuld School of Nursing.

The data given in Table 1 refer to the total enrollment, but many of these students were not from the state of Maryland. At the University of Maryland 87 percent of the students enrolled during the period of study were from the state of Maryland and the Negro students were from within the state. At Columbia Union College 45 percent of all the United States students and 30 percent of the Negro students were from the state of Maryland. The four schools reporting in the junior college category accepted students primarily from the state of Maryland. Only 4 percent of the students were from out of state. All Negro students were from within the state.

In the diploma program 70 percent of the students were from the state of Maryland. The percentage varied widely among the schools. At the Johns Hopkins School of Nursing 80 percent of the students were from states other than Maryland. The school carrying the next highest percentage of out of state students was the Helen Fuld School of Nursing, where there was an average of 58 percent out of state students over the five-year interval. In the diploma program 47 percent of the Negro students were from the state of Maryland. Sixty-four of the 75 Maryland Negro students were from Baltimore and 73 percent of these were trained at the Helene Fuld School of Nursing. Since Negroes form almost one-half of the population of Baltimore, it is of special interest to note the proportion of nursing students from Baltimore who are Negro. At Baltimore Junior College there was a ratio of six white students to one Negro. The ratios are given in Table 2 for diploma schools which have students from Baltimore. If one excludes the Helene Fuld School of Nursing, the ratio is 54 white to 1 Negro. If one includes the Helene Fuld School of Nursing, the ratio is 14 to 1.

Discussion

A number of hypotheses may explain the Table 2 findings. One is that there continues to be discrimination in admission practices. Most schools would now deny a discriminatory policy but it seems reasonable to assume that in several instances institutions continue to reflect a long history of discrimination. An

TABLE 2

RACIAL DISTRIBUTION OF BALTIMORE STUDENTS IN DIPLOMA SCHOOLS OF NURSING IN BALTIMORE CITY

Name of Schools	No. White	No. Negro	No. of Years Included
Bon Secours Hospital	41	0	3
Church Home and Hospital	76	1	5
Franklin Square Hospital	11	4	3
Helene Fuld School of Nursing	0	47	5
Johns Hopkins Hospital	50	2	5
Lutheran Hospital	15	1	5
Maryland General Hospital	130	0	5
Mercy Hospital	160	1	5
Sinai Hospital	142	3	5
St. Agnes Hospital	49	3	5
St. Joseph's Hospital	118	1	5
Union Memorial Hospital	95	1	5

institution that has been segregated for many years does not instantly become desegregated by announcing a non-discriminatory policy unless there is a strong determination on the part of the minority group to have the institution desegregated. Schools which now have no Negro applicants may find themselves in this position because of reports among Negro students that few or no applicants are accepted. This has been shown to be a factor of highest importance among Negro premedical students.[3]

The main problem, however, is not merely one of integration of institutions but of increasing the manpower pool from the Negro population. If one-half of the Negro nursing students now attending the Helene Fuld School of Nursing were admitted to other schools and they were replaced by an equal number of white students, this would affect the distribution without actually increasing the numbers. However, the present distribution would suggest that there is a serious neglect of opportunities for Negroes which may, in fact, be discriminatory and that the number of Negro students could be increased by a more serious effort. For example, a hospital which enrolled 130 white students from Baltimore over a five-year interval and had no Negro students may not be trying hard enough in a city that is almost one-half Negro.

This situation justifies an attack on remaining discrimination or de facto segregation. There should be more than an announcement of a non-discriminatory policy or a passive acceptance of the present position. An educational institution which provides opportunities for students from all parts of the country should at least provide some opportunity for one-half of the population in the area where it is located and should make an effort to do so. Only strong pressure can counteract the inertia. In addition, the State and Federal Government should exert strong economic pressures to improve the opportunities for Negro citizens. Incidentally, it would appear from the experience of at least one school that increasing the number of Negro faculty does not seem, in itself, to lead to an increase in the proportion of Negro students. The invaluable contribution to clinical medicine made by clinic patients is not always recognized because the patients are often receiving free care. Recent federal legislation has somewhat altered this situation but in this respect the Negro community has in the past contributed a great deal and the health professions can recognize this contribution by providing more educational opportunities than have been provided in the past.

A second hypothesis relates to the availability of qualified candidates. Studies have shown that the achievement scores of Negro students tend to be one standard deviation below those of white students.[5] The mean scores of Negro students in the Medical College Aptitude Tests have also been shown to be below that of white students.[6] This educational disadvantage is a reflection of the educational system at elementary and secondary levels. The Negro student begins with a disadvantage and this disadvantage persists with the result of substantially reducing his chances of higher education.

This issue has recently been raised in connection with university education.[7, 8, 9] Because of the one standard deviation gap, if an institution selected its students from the upper quarter of the high school graduating class, white students would have five times the chance of being admitted if the number of white and Negro students were equal. In a city with a racial composition such as Baltimore the white high school graduate would have an advantage which would increase his chances of being accepted by three to nine times that of a Negro, depending on whether the selection were made from the upper half or the upper 10 percent of high school graduates. This is a serious handicap but it is often exaggerated. Differences in educational achievement cannot, in themselves, explain a ratio of 130 to 0 or 160 to 1.

The gap can be narrowed by providing better educational opportunities at the elementary and secondary level. This means essentially increasing the expenditure for education in cities like Baltimore. This is not to imply that money will solve the entire problem but it should help to provide more and better qualified teachers, a better physical environment, and more facilities than are currently available. The need is for a massive effort based on experience with sound experimental programs. There needs to be wider experimentation in programs such as the Early School Admissions Project and the reading centers where students at the elementary and secondary levels receive remedial reading instruction, a continuation of the team teaching projects which involve 13 schools in the Baltimore area, a further implementation of the Community School concept which is a total community effort to educate the disadvantaged (parent and child). At the high school level we need programs such as Upward Bound and the Johns Hopkins Summer Pilot Project. There is also an obvious need for greater emphasis on the quantity and quality of teaching in science and mathematics for students attending predominantly Negro schools at the elementary and secondary level. This broad approach could increase the potential, not only for health manpower, but for many other areas.

The third hypothesis is that Negroes are unable to afford the cost of higher education. The costs are two-fold: the expenses of education and the loss of income which could have been earned by immediately starting a job. Poor students who have had to struggle to obtain a college education cannot forego the attractive offers which are now made on graduation and choose instead another five year or more of education at even greater costs. One should not assume, however, that Negroes are unable to appreciate the fact that the returns in the health professions are attractive and that they are worth the effort. It is unfortunate that the lack of financial resources have kept Negroes from preparing for occupations in which the need is obviously so great.

The economic burden could be relieved by adequate scholarships and stipends. There are not enough of these and Negroes do not know enough about those which actually exist. Better counseling would make these students more aware of the government and private sources of financial assistance.

It is sometimes felt that competition from other careers is causing an under-representation in the health field and it is true that more careers are now open to Negroes than formerly. It does not seem likely, however, that this is the major problem. In a recent study of graduates in predominantly Negro colleges, nearly 40 percent of the Negro graduates surveyed in 1964 were planning to enter health related fields. This proportion was equalled only by teaching at elementary and secondary levels.[10] An analysis of the areas of study among students of predominantly Negro colleges in the state of Maryland does not show the same high percentage of students interested in health related fields but it does show a substantial and increasing pool which could be tapped for health manpower. The under-representation of Negroes in the health professions can be attributed more to a lack of opportunity than to a lack of interest.

As a matter of personal interest we obtained data on the legal profession. At the only accredited law school in the state two Negro students were enrolled in the day division and five in the evening division in the classes of '66-'69. The total enrollment for these four years was 460 in the day division and 347 in the evening division. At least the legal profession does not seem to be offering much competition.

What is needed is more active recruitment. The health industry has not been as aggressive in its search for Negro talent as has been the case with some other forms of industry. Representatives from the educational institutions must go where the Negroes are, must tell them that they are badly needed, and that stipends are available for qualified students. This approach will go a long way towards making Negroes feel more comfortable, especially if on enrollment they find a willingness on the part of the faculty and students to include them in the main stream of institutional life.

It is never a pleasant experience for a person to have to spend three or four years at a place where he feels he is not wanted, whether the institution is predominantly white or predominantly black. The problem of social isolation may be one reason why more Negroes are not studying in Maryland schools. This hypothesis is suggested by the fact that some Negro students who have been accepted by schools in Maryland have preferred to go elsewhere. On the other hand, not all of these candidates have gone to predominantly Negro institutions. This is a difficult problem and changes occur only slowly. The predominantly Negro professional schools are integrating more rapidly than the predominantly white schools. Howard University School of Dentistry is a good example of this. It is often more effective to start anew than to change old patterns.

A final proposal is, therefore, added. The state, with the assistance of federal funds, should establish a fully integrated school for the health professions at a predominantly Negro college, and offer the first two years of medicine there. This institution should be closely affiliated to both the established medical and dental schools in the area. Placement at a predominantly Negro college would attract Negroes. Affiliation with the other well-established professional institutions in the state would attract white students. The development should be phased so as to permit a solid infra-structure on which to build the first two years of medicine. Graduates from the first two years of medicine may fill places vacant at this level at both the medical schools in the city and in other states. It is possible that as the state provides leadership, other institutions will follow and provide more opportunities than they do at present.

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APPENDIX II

TABLE 2-1

DISTRIBUTION OF NON-FEDERAL, HOSPITAL BASED PHYSICIANS, MARYLAND–D.C.

Area	Interns	Residents	Other	Total
Baltimore Region	260	1005	403	1668
Western Maryland	0	3	14	17
Montgomery and Prince Georges Counties	22	88	100	210
Southern Maryland	0	1	1	2
Eastern Shore	0	1	17	18
Maryland Total	282	1098	535	1915
Washington	154	556	227	937
Virginia, "D.C." Counties	8	42	32	82
Area Total	444	1696	794	2934

TABLE 2-2

DISTRIBUTION OF FEDERAL PHYSICIANS* BY AGENCY AND REGION–MARYLAND, D.C.

	Air Force	Army	Navy	PHS	V.A.	Other	Total
Baltimore Region	12	116	46	135	63	19	391
Western Maryland	0	20	1	0	1	2	24
Montgomery & Prince Georges	102	136	244	923	29	76	1510
Southern Maryland	0	0	21	0	0	0	21
Eastern Shore	0	1	8	2	32	0	43
Washington	83	384	86	174	191	94	1012
Va., "D.C.." Counties	12	101	20	78	13	41	265
Total	**209**	**758**	**426**	**1312**	**329**	**232**	**3266**

*including 77 interns and 438 residents

TABLE 2-3

AGE DISTRIBUTION OF PHYSICIANS IN PRIVATE PRACTICE IN MARYLAND (percentages)

	<34	35-44	45-54	55-64	65-74	75+	Total
Baltimore Region	7	31	28	20	10	4	100%
Western Maryland	7	34	27	19	10	4	101%
Montgomery & Prince Georges	13	40	28	11	5	2	99%
Southern Maryland	11	31	31	11	11	6	101%
Eastern Shore	9	29	31	14	12	6	101%

TABLE 2-4

PLACE OF TRAINING OF ALL MARYLAND NON-FEDERAL PHYSICIANS BY TYPE OF PRACTICE

	General Practice	Medical Specialties	Surgical Specialties	Other Specialties	Total
University of Maryland	395	320	420	170	1305
Johns Hopkins	28	168	182	74	452
Georgetown	69	74	68	54	265
George Washington	50	68	65	48	231
Howard	64	21	20	10	115
Other U.S.	319	652	632	673	2276
Foreign	132	253	423	381	1189
Total	**1,057**	**1,556**	**1,810**	**1,410**	**5,833**

(includes interns, residents, and physicians in teaching and administration)

TABLE 2-5

DECADE OF GRADUATION BY MEDICAL SCHOOL, MARYLAND–D.C. AREA, NON-FEDERAL, DIRECT CARE PHYSICIANS

	Decade of Graduation								
	<1906	1907–1916	1917–1926	1927–1936	1937–1946	1947–1956	1957–1966	Total	Total Maryland Only
University of Maryland	11	37	84	233	350	292	339	1346	1280
Johns Hopkins	1	12	64	79	120	90	124	490	428
Georgetown	4	6	51	138	188	170	139	696	222
George Washington	0	9	36	117	146	169	155	632	205
Howard	0	2	36	58	58	94	167	415	108
Foreign	0	2	48	67	193	591	971	1872	1192
Other	6	46	94	316	578	598	911	2549	1448
Total	22	114	413	1008	1633	2004	2806	8000	4883

(excludes physicians in teaching, administration, etc.)

TABLE 3-1

ESTIMATED NUMBERS OF WORKING DIPLOMA NURSES TO 1980, BASED ON ESTIMATED NUMBER OF REGISTERED NURSES EMPLOYED IN 1966, NUMBER OF GRADUATES FROM DIPLOMA SCHOOLS, AND 4 PERCENT ATTRITION

Year	Estimated No. Diploma Graduates Employed	No. of Diploma Graduates	4 Percent Attrition	Net Increase
1967	7820	520	313	207
1968	8027	520	321	199
1969	8226	520	329	191
1970	8417	520	337	183
1971	8600	520	344	176
1972	8776	520	351	169
1973	8945	520	358	162
1974	9107	520	364	156
1975	9263	520	370	150
1976	9410	520	376	144
1977	9554	520	382	138
1978	9692	520	388	132
1979	9824	520	393	127
1980	9951	520	398	122
	-400	(Estimated diploma nurses going on to Baccaluareate programs)		
	9551			

TABLE 3-2

PROJECTED ESTIMATES TO 1980 BASED ON THE ACTUAL NUMBER OF GRADUATES FROM *BACCALAUREATE* PROGRAMS IN 1967, AN INCREASE TO 230 GRADUATES IN 1970, REMAINING CONSTANT THEREAFTER (INCLUDING DIPLOMA GRADUATES ENROLLED IN BACCALAUREATE PROGRAMS)

Year	Estimated No. Baccalaureate Graduates Employed	No. of Baccalaureate Graduates	4 Percent Attrition	Net Increase
1967	1200	195	48	147
1968	1347	210	54	156
1969	1503	220	60	160
1970	1663	230	67	163
1971	1826	230	73	157
1972	1983	230	79	151
1973	2134	230	85	145
1974	2279	230	91	139
1975	2418	230	97	133
1976	2551	230	102	128
1977	2679	230	107	123
1978	2802	230	112	118
1979	2920	230	117	113
	3033	230	121	109
	-800	(estimated number baccalaureate nurses going on to M.A. or higher degree)		
1980	2233			

TABLE 3-3

ESTIMATED INCREASE IN EMPLOYED GRADUATES OF MASTER'S AND HIGHER DEGREE PROGRAMS (BASED ON A 2 PERCENT ANNUAL INCREASE IN GRADUATES AND THE ACTUAL NUMBER OF GRADUATES IN 1967)

Year	Estimated No. of Masters and Higher Degree Graduates Employed	Number of Masters and Higher Degree Graduates	4 Percent Attrition	Net Increase
1967	425	55	17	38
1968	463	56	18	38
1969	501	57	20	37
1970	538	58	22	36
1971	574	59	23	36
1972	610	60	24	36
1973	646	61	26	35
1974	681	62	27	35
1975	716	63	29	34
1976	750	64	30	34
1977	784	65	31	34
1978	818	66	33	33
1979	851	67	34	33
1980	884	68	35	33

TABLE 3-4

ESTIMATED SUPPLY OF ASSOCIATE DEGREE PROGRAM GRADUATES BASED ON THE CURRENT NUMBER OF GRADUATES FROM TWO SCHOOLS AND EXPECTED NUMBER FROM THE EIGHT SCHOOLS NOW STARTED

Year	Estimated No. Associate Degree Graduates Employed	Associate Degree Graduates	4 Percent Attrition	Net Increase
1967	100	30	4	26
1968	126	60	5	55
1969	181	120	7	113
1970	294	160	12	148
1971	442	160	18	142
1972	584	160	23	137
1973	721	160	29	131
1974	852	160	34	126
1975	978	160	39	121
1976	1099	160	44	116
1977	1115	160	45	115
1978	1230	160	49	111
1979	1341	160	54	106
1980	1445	160	58	102

TABLE 3-5

REGISTERED NURSES
TOTAL POSITIONS AND PERCENTAGE OF VACANCIES BY COUNTY, 1966[1]

County	Number Employed	Vacancies		Total Budgeted Positions
		Number	Percent	
Allegany	182	7	3.7	189
Anne Arundel	140	105	42.9	245
Baltimore City	1917	467	19.6	2384
Baltimore County	444	143	2.4	587
Calvert	13	5	27.7	18
Carroll	84	2	2.3	86
Cecil	136	7	4.9	143
Charles	17	4	19.0	21
Dorchester	65	12	15.6	77
Frederick	88	15	14.6	103
Garrett	14	4	22.2	18
Harford	56	20	26.3	76
Howard	3	1	25.0	4
Kent and Queen Anne	25	0	0.0	25
Montgomery	720	135	15.8	855
Prince Georges	274	49	15.2	323
St. Mary's	19	7	26.9	26
Somerset	6	8	57.1	14
Talbot	79	12	13.2	91
Washington	189	0	0.0	189
Wicomico	192	6	3.0	198
Total Maryland	4663	1009	17.8	5672

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[1] Source: Manpower in Maryland's Hospitals. Hospital Council of Maryland, Inc., July 1966.

APPENDIX III

INSTITUTIONS OFFERING OR PLANNING TO OFFER INSTRUCTION IN THE ALLIED HEALTH PROFESSIONS

UNIVERSITIES:	
University of Maryland	Preliminary plan for a school of Allied Health Profession on the Baltimore City Campus.
Johns Hopkins University	Ad hoc committee reviewing its needs in the area of the allied health professions.
STATE COLLEGES:	
Morgan State College	Undergraduate and graduate curricula in nursing, physical therapy, occupational therapy, nutrition and medical technology.
Towson State College	Proposed medical Technology program and proposed nursing education program.
COMMUNITY COLLEGES:	
Allegany Community College	Program in dental hygiene in fall of 1969; beginning of a degree program in nursing education.
Baltimore Junior College	Offers the following paramedical programs: medical records technology medical secretaryship laboratory technology two-year nursing programs medical technology mental health technology following programs to begin next year: dental technology X-ray technology physical therapy dental assisting occupational therapy technology
Catonsville Community College	Curriculums of mental health technology and nursing; following to be instituted

Catonsville Community College (Cont.)	during the next two years: X-ray technology, nuclear medicine technology, physical therapy technology, occupational therapy technology.
Essex Community College	Long range plans for the development of paramedical curriculums. Three new curriculums in September 1968: medical secretary mental health technicians early childhood development
Harford Junior College	Some programs in the paramedical fields in or about 1970.
Prince George's Community College	A new technical building will house five programs in paramedical field in September 1969: practical nursing dental assisting medical or laboratory assistant physical therapy aides X-ray technician at present have A.A. degree program with graduates ready for the Registered Nurses Examination.

PRIVATE COLLEGES:

Villa Julie College	At present: preparation for medical secretaries and medical assistants first two years preparation for cytotechnologists Plans include programs in: environmental health medical records librarian social work assistant dental assistant
Mount Saint Agnes College	A degree program for medical technologists.

MEDICAL and CHIRURGICAL FACULTY
of the STATE OF MARYLAND

1211 Cathedral Street Baltimore, Maryland 21201
Telephone 539-0872 (Area Code 301)

April 3, 1968

Mr. Ellery Woodworth, Chairman
Advisory Council Committee on Medical
Manpower Training Facilities
2100 Guilford Avenue
Baltimore, Maryland 21218

Dear Mr. Woodworth:

It was obvious to me yesterday that it was not proper to reopen the question of the proposals regarding physicians in connection with the third medical school and the health manpower study. However, there are certain premises within the Report of the Health Manpower Study with which we cannot agree.

I am enclosing several copies of a summary prepared in this connection, which was adopted by the Faculty's Council in principle. I do not believe this will change any of the recommendations made by your committee but did feel that we should be on record so that we are not agreeing with the presumptions made by the special study group involved in health manpower shortages.

We did correct one of the statements–that being the one dealing with an assured income because of Title 19 funds–at the meeting, so this particular item has been deleted from the comments in the attached summary.

I am sorry that this wasn't given to you sooner, but there has been no harm done in this connection as your statement will not affect substantially, if at all, the recommendations of your group.

Sincerely,

John Sargeant
Executive Secretary

JS/sg
Enclosure

The Medical and Chirurgical Faculty of the State of Maryland disagrees with the report of the Health Manpower Study Committee and states that there is currently an acute shortage of physicians to render first-line medical care in this State. A most conservative estimate is that a minimum of 100 such first-line care physicians could readily and easily be absorbed into the physician population; and could easily and readily be placed throughout the State. These physicians would be able to commence earning an adequate income from the first day they enter practice, provided they are willing to devote their time to the provision of quality care to Maryland's citizens.

It is our opinion that most physicians rendering this type of service in the State are already overburdened and overworked. In addition to relieving their heavy workload, physicians as responsible leaders in the community could reassume their role of leadership in health affairs, a situation that has had to take second place to the heavy demands of their primary role, that of delivering health care to the residents of their communities.

The profession also disagrees with the finding that

> "If the consumers of medical care in the rural regions of Maryland are truly concerned with the shortage of physicians, they should find some way to make practice in the rural areas financially and professionally more attractive."

This argument is vague and indefinite in its wording. There are vacant buildings throughout the country built by local communities in order to attract a physician. Alas, they have failed to succeed in their desires. It is believed that physicians will willingly go to rural communities and provide health care if the physician population throughout the entire State is relieved by an increased supply of physicians. The law of supply and demand will prevail.

If the Committee has some constructive suggestion to a community that would, indeed, attract a physician to it, it should willingly and frankly make such a suggestion. We know of no proposals that are forthcoming either on a local or national level that would accomplish such a purpose. We believe this is evading the basic issue which is a physician shortage and which we have stated earlier we believe to be acute in this State.

We would recommend, in addition, that a comprehensive evaluation of physicians currently occupying administrative positions be undertaken with a view to urging such physicians to return to their primary purpose, that of rendering health care to the public.

In addition, we believe that medical schools should be urged to (a) carefully evaluate medical school applicants to ascertain if such individuals are truly interested in studying medicine with the main objective that of patient care and (b) carefully evaluate the attitudes of teaching personnel so as to ensure they direct medical students interests towards that of rendering patient care to the public, rather than research or administration. We also believe that in any study to determine what activities can be performed by lesser-qualified or trained persons, such as registered nurses and "assistant physicians" all administrative and other type of positions now occupied by physicians be evaluated at the same time and in the same light.

REPORT

ON

PHARMACY

to

THE COMMITTEE ON HEALTH MANPOWER
MARYLAND ADVISORY COUNCIL FOR HIGHER EDUCATION

submitted by

Ralph F. Shangraw, Ph.D., Associate Professor,
School of Pharmacy, University of Maryland.

Peter P. Lamy, Ph.D., Associate Professor,
School of Pharmacy, University of Maryland.

in consultation with

Nathan I. Gruz, Executive Secretary,
Maryland Pharmaceutical Association.

Paul J. LeSage, President,
Maryland Society of Hospital Pharmacists.

Francis S. Balassone, Secretary
Maryland Board of Pharmacy.

INTRODUCTION

The transferral of the art of pharmacy from the pharmacist to the pharmaceutical industry has progressed to the point where a serious reevaluation of the role of the pharmacist in the health sciences is presently taking place. While the physical aspects of drug distribution still monopolize a large share of the pharmacist's time, it has become increasingly evident that the pharmacist's knowledge of drugs qualifies him to provide more important services to both the public and the physician. The main function of pharmacy has become more clinical in nature and more information oriented, involving a sum total of knowledge, understanding, judgment, skills, controls, and ethics that assure optimal safety in the distribution and use of medications. This function becomes more critical as the safety factor in drug therapy decreases and as more knowledge is gained about drug sensitivities and drug interactions.

PRESENTS NEEDS

The changing nature of the role of the pharmacist in the health industry as well as the changing nature of the health industry itself, makes it exceedingly difficult to project manpower needs on the basis of past records. In projecting manpower needs, present as well as future demands on pharmacy will have to be considered. There is already a shortage of pharmacists in Maryland. This shortage results from a number of factors:

(1) A change in the educational requirements for licensure which, in 1960, placed all accredited schools of pharmacy on a five year curriculum (with an optional sixth year). This requirement caused a temporary but often drastic decrease in enrollment and the resulting number of pharmacy graduates which is only now returning to normal.

(2) A relative decreased interest in careers in the health professions which has been reflected more quickly in pharmacy than in medicine or dentistry.

(3) Disenchantment of students with the economic aspects of community pharmacy as it has traditionally existed and lack of awareness of the new role of the pharmacist in the health sciences.

(4) On a national level, a deficit of pharmacists has been developing at the rate of 700 per year. This figure is based solely on attrition and does not consider the growth in population. The U.S. Department of Labor predicts a national shortage of 5,000 pharmacists by 1975. This prediction is, if anything, conservative.

FUTURE DEMAND

There is no reason to believe that the present shortage of pharmacists will become less acute in the next ten years. In fact, if present trends continue, the shortage will increase in severity for the following reasons:

(1) Prescription volume in community pharmacies in Maryland has increased from 13,400,000 in 1962 to 17,500,000 in 1967. This number will continue to increase as prescription costs become covered by governmental programs. For instance, it is estimated that people 65 and over receive 12 prescriptions per year and that before such programs were available, up to 35% of these prescriptions were not filled or were filled with physician's samples. Estimates of new prescriptions generated in Maryland alone by governmental programs range from one to two million per year. In addition, private third party payment of prescriptions will result in further increases in prescription volume. This increase has already been experienced by the Canadian drug prepayment plan, Green Shield. Prescription Services, Inc., the organization that offers Green Shield reports that the average prescription expenditure for a person in the Windsor, Ontario area who finances his own prescriptions is $7.60 per year, whereas the average utilization rate for a regular subscriber to Green Shield is $18.20 per year.

(2) On a national level, about 40% of all hospitals still lack pharmaceutical services. This figure is approximated in Maryland. Recently, 15 Maryland hospitals, of 29 questioned, revealed a shortage of pharmacists. In the last two years, the two teaching hospitals associated with Schools of Medicine in Maryland have more than doubled their complement of pharmacists, i.e., The Johns Hopkins Hospital now employs 20 pharmacists (who also work a total of 120 hours/week overtime as there is still a shortage of personnel) and University Hospital employs 9 pharmacists.

(3) Most pharmacists are presently working 48-52 hours per week. As fewer pharmacists become self-employed, there will be strong demands for a shorter work week (40 hrs./week) which would result in a 20% increase in manpower needs.

(4) Increased demands are anticipated for pharmacy graduates in areas other than community or institutional pharmacy, such as in pharmaceutical companies, government agencies and education. At the present time, Pharmacy offers the broadest-based undergraduate program covering the biological, chemical and physical sciences. As such, this curriculum has been used and will continue to be used as the basic program for many diversified careers both in and outside the

health sciences. Currently, about 10-20% of pharmacy graduates continue their education or take up employment in areas other than community or institutional pharmacy.

INSTITUTIONAL PHARMACY

The increased demand for pharmaceutical services at an institutional level is one which cannot be based on past records but must be viewed in light of new approaches to health care services and the changing role of the pharmacist. The strong influence of legislation has already been felt throughout inpatient (Title 18) and outpatient (Title 19) hospital pharmacies. A telephone survey of several Baltimore area hospitals shows the following increases in outpatient prescriptions.

TABLE I

NUMBER OF OUTPATIENT PRESCRIPTIONS

Hospital	A	B	C	D
Year				
1964	–	64,000	69,000	71,000
1965	14,000	69,000	78,000	73,000
1966 (Meidcare activated)	23,000	78,000	99,000	74,000
1967	28,000	100,000	143,000	77,500

Additionally, under Public Law 89-97, Nursing Homes and Extended Care Facilities must offer pharmaceutical services in order to be eligible for Medicare payments. There are currently 200 such licensed facilities in Maryland. Unquestionably, many of these will demand the services of full-time or regular part-time pharmacists by 1980.

It has been suggested that new procedures, such as unit-dose dispensing, will become prevalent in institutions and that these procedures will increase the productivity and thus lessen the demand for pharmacy manpower. From all available evidence, this is probably an erroneous estimate. For example, the Hospital of the University of Kentucky, a 300-bed institution, would ordinarily employ about 4 pharmacists. Using the unit-dose system, 15 pharmacists are actually employed. Furthermore, should the concept of decentralized pharmacies be accepted (as it has been in part in California) there would be need for one pharmacist for every one or two patient care units. This concept itself, which might be expected to be operative in 1980 would demand an enormous increase in pharmacy manpower. At that time, pharmacists will no longer only operate in the traditional, centralized location but, as members of the health team, will have responsibilities for patient care throughout the hospital.

SUPPLY OF PHARMACISTS

Maryland has a State supported School of Pharmacy. Nevertheless, this school is not meeting the demand for pharmacists as is evidenced by the large number of pharmacists coming into the State each year. Table II lists the number of pharmacists which have been licensed by the State Board of Pharmacy in the past ten years, either by reciprocity or examination. Subtracting those pharmacists who have left the State, a net total of new pharmacists is obtained.

TABLE II

SOURCE OF NEW PHARMACY MANPOWER IN MARYLAND DURING PAST TEN YEARS

Year	Reciprocity In	Reciprocity Out	Net In	Examination	Total	University of Maryland Graduates
57-58	51	21	30	53	83	53
58-59	46	17	29	79	108	50
59-60	46	19	27	55	82	43
60-61	33	18	15	63	78	42
61-62	35	20	15	62	77	35
62-63	54	18	36	74	110	43
63-64	63	20	43	11	54	2
65-66	44	25	19	64	83	25
66-67	61	27	34	58	92	30

The proportion of new pharmacists supplied by the University of Maryland School of Pharmacy is shown in Figure 1. It can be seen that the University of Maryland is supplying a much lower percentage of the needs of the State now than it supplied ten years ago. In the three-year period from 1963-1965, the percentage of registered pharmacists practicing in the State of Maryland who graduated from the University of Maryland School of Pharmacy dropped from 66% to 60%. This figure has continued to fall. At the present time, the School of Pharmacy has 61, 43, and 36 students enrolled in the third, fourth, and fifth year classes, respectively, indicating that a recovery is being made from the low experienced during the change-over from the four to five year programs. However, present facilities limit class size to 70 graduates. The demand for pharmacists in Maryland already exceeds this number and the gap between demand and supply graduating from the School of Pharmacy will increase still further by 1980 for the following specific reasons (some peculiar to Maryland):

(1) As the shortage of pharmacists becomes more acute throughout the country, differentials in salaries between Maryland and supplier states (Pennsylvania, New York, Massachusetts) will decrease, resulting in a decreased in-migration.

(2) The closing of the George Washington University School of Pharmacy (1965) has cut off a significant source of pharmacists for the D.C. Metropolitan area. This decrease in available graduates must be offset by the Schools of Pharmacy at Howard University and the University of Maryland.

(3) No reserve in pharmacy manpower is presently available in Maryland. Although figures released by the State Board of Pharmacy indicate 480 part-time pharmacists in Maryland, these pharmacists work part-time by choice. In most instances, they are retired or are fully employed in other positions wherein their pharmaceutical background is desirable. They are often working part-time as a result of pleas of assistance from pharmacy owners who must comply with State regulatory requirements. Few, if any, of these so-called part-time pharmacists can be expected to switch to full-time pharmacy positions.

(4) The 1968 Maryland Health Manpower Report lists about 6,000, a ratio of 1 pharmacist to every 3 physicians. Projections for 1980 call for approximately 13,000 physicians and 2,500 pharmacists, a ratio of only 1 pharmacist to more than 5 physicians. Even if current pharmaceutical services were judged to be adequate, then the projected ratio would certainly suggest a shortage of pharmacists in 1980.

It has been suggested that increased demands on pharmacy manpower could be met through increased productivity of individual pharmacists. This increased productivity could result from:

(1) Increased utilization of pre-packaged medication and a continued decrease in the pharmacist's compounding responsibilities.

(2) Utilization of pharmacy technicians in areas which do not involve professional judgment and responsibility.

(3) More efficient utilization of professional personnel as evidenced by fewer one-man pharmacies and less time devoted to non-professional duties.

Most probably, the combined effects of these three innovations would serve to meet normal increased requirements due to anticipated population growth. However, they would in no way begin to meet the new and changing demands for pharmaceutical services, created, for example, by government supported health plans which aim to assure medical and prescription services to all individuals, increased emphasis on preventative health and further governmental programs to decrease hospitalization of patients and rather treat them on an ambulatory basis.

CONCLUSIONS AND RECOMMENDATIONS

If current trends continue, there will be a critical shortage of pharmacists in Maryland in 1980.

Recommendation 1:

Immediate steps must be taken to expand enrollment in the School of Pharmacy to presently-planned capacity.

Recommendation 2:

Maryland's dependence on out-of-state pharmacists must be reduced.

Recommendation 3:

The State of Maryland should make available funds to permit the establishment of experimental academic programs which will supply the manpower necessary for the anticipated diverse needs of drug distribution and drug information and control.

Recommendation 4:

The possible training and utilization of pharmacy technicians should be carefully studied.

At the present time a joint committee composed of representatives from the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, the American Pharmaceutical Association and the American Society of Hospital Pharmacists is conducting a thorough study of all aspects of pharmacy technicians. At the completion of this study, the State of Maryland should be ready to implement any recommendations as rapidly as possible.

Recommendation 5:

Deliberate planning should be started now for an increased capacity of the School of Pharmacy.

A detailed study should be instituted at the earliest possible moment by pharmaceutical leaders, economists and State governmental agencies. This committee should be charged with the responsibility to determine the specific numerical needs for pharmacy manpower as soon as the effects of third-party payments, governmental health programs and changing patterns of medical practices can be ascertained.

MEMORANDUM: April 2, 1968

TO: Mr. Ellery B. Woodworth
Advisory Council for Higher Education

FROM: Robert M. Vidaver, M.D., Director
Psychiatric Education and Training

RE: College of Allied Health Sciences

The question is not whether to have a College of Allied Health Sciences—training programs in the health field already abound at all educational levels in Maryland—but rather: (1) if there should be one (or more) MODEL colleges capable of offering leadership in decisive educational areas to the smaller institutions; and, (2) is there usefulness to an ONGOING PLANNING GROUP responsible to the Advisory Council and involving key college, community, medical school and State agency persons?

The imperative to a Model College of Allied Health Sciences for Maryland relates to:

A. The need for research into the educational process, uncovering instructional methods and materials best suited to each level of trainee.

B. The need for continuing curriculum design and reassessment in conjunction with advancing medical techniques; development of core curricula; audio-visual materials, videotapes, films and programmed manuals for distribution to all other interested training institutions.

C. The development of trained faculty, knowledgeable in the new equipment; new team approaches, and trained in appropriate teaching methods.

D. Availability of a center for CONTINUING EDUCATION of older graduate technicians from throughout the State, capable of implementing:

   1. CERTIFICATE COURSES for upgrading skills of key personnel, then able to train others in these techniques following return to the parent institution.

2. WORKSHOPS of limited duration, preferably scheduled in various localities about the state, yet incorporating a single faculty team and special program design for maximum educational impact.

3. CAREER LADDER programs incorporating basic education, supervisory techniques and specialty skills culminating in a higher degree or certificate, thus enabling selected health personnel to move higher in the professional status by meeting appropriate educational standards.

E. In liaison with associated hospital, clinic and neighborhood health centers experiment with new programs in the delivery of health services through training programs for technicians and associate professionals explicitly designed to augment the unorthodox clinical program.

F. Demonstrate procedures for more efficient utilization of professional manpower through team procedures utilizing TRAINED technicians and associate professionals. Good systems, maximizing efficiency without sacrifice in the quality of patient care, could serve as valuable models for smaller hospital/education complexes throughout the State.

G. Because of its pre-eminence such a MODEL college of Allied Health Sciences could more effectively recruit new manpower resources; alert public awareness to new health personnel and comprehensive care programs; organize and follow through on grant proposals to Federal, State and private health foundations; and react rapidly to feedback from institutions and communities across the state respective to special needs and unequal distribution of personnel.

H. Trainees would learn technician's skills in relation to complex computer equipment, library facilities, specialized faculty and sophisticated medical/surgical equipment unavailable at any but the few largest medical complexes in Maryland.

Any major reduction in the cost of medical services, especially in the public sector, or in the implementation of new comprehensive care services is dependent on effective use of technicians and associate professionals, and thereby multiplication of scarce professional capabilities. Although the lag time in the training of associate professionals is far less than physicians, the planning of such a radical new kind of educational institution will take considerable study, and the exploration of similar institutions around the country. This kind of task seems beyond the scope of this subcommittee, yet unaccepting of postponement "to some future date." One solution would be the recommendation, by this group to the Advisory Council, of an Allied Health

Science College in principle, and urging the Council's appointment of an appropriate study group to analyze issues of needs, costs, Federal support, likely change in the future delivery of services (medical, dental, public health and mental health), location and, most importantly, the potential gains accruing to Maryland health services by pioneering *now* in accord with recommendations of both the President's National Advisory Commission on Health Manpower and the National Advisory Health Council.

A MARYLAND STATE COLLEGE OF THE ALLIED HEALTH SCIENCES

A PROPOSAL FOR AN INTER-UNIVERSITY CONSORTIUM INTEGRATED WITH HOSPITAL AND COMPREHENSIVE CARE CLINICAL FACILITIES:

The NATIONAL ADVISORY HEALTH COUNCIL'S report on education for the allied health professions and services recommended the following:

1. Development of interdisciplinary schools for the allied health professions by universities and other centers;
2. Instruction of faculty in educational methods and techniques;
3. Studies on the methods of delivery of health services, with identification of new occupational needs and the design of appropriate curricula for the optimum utilization of technical and auxiliary personnel by professionals;
4. Formulation of core curricula in the allied health fields: establishment of "career ladder" job series for the upgrading of personnel, including design of necessary advanced educational components; studies on the roles of certification, licensing and accreditation;
5. Studies in recruitment methods; interdisciplinary recruiting;
6. Regional, State and community wide planning for development of educational programs; strengthened liaison between community and four-year colleges and with medical center training programs and clinical facilities available for trainee field experience.

As the means to these ends, the Council's report to the President suggests:

> "With the combining of several programs in a college or central unit, duplications in such areas as administration, faculty, and facilities can be minimized. More importantly, individuals who will later work together in the medical scene are prepared together. Communication with other health professionals, a critical factor in the provision of health services, is learned during their educational experience."

PROPOSED: A MARYLAND STATE COLLEGE OF THE ALLIED HEALTH SCIENCES:

Phase I–A consortium linking interested schools, colleges, hospitals, State agency programs, public health facilities and anti-poverty efforts in the METROPOLITAN BALTIMORE AREA.

COLLEGE DESIGN:

Under authority of a board of trustees derived from the member institutions, a permanent administrative staff and faculty would organize an interdisciplinary college of the allied health sciences which would: (1) cooperate, as education consultants, with all interested institutions; (2) wherever possible, and without disturbing their academic independence, utilize existing para-medical programs as basic components in a graded series of educational "steps" developed for each of the several health careers; and (3) coordinate the assignment of students from the participating colleges and CAA programs in appropriate clinical facilities, preferably on an interdisciplinary team–care basis; provide faculty for clinical supervision.

CENTRAL FUNCTIONS OF THE COLLEGE:

1. Initiate programs of research in education pertinent to the training of health personnel at all levels and educational backgrounds.
2. Develop a wide range of instructional materials (e.g., films, video-tapes, programmed texts) for general distribution.
3. Develop core curricula suitable to the beginning education of students from several health fields; develop flexible, relatively standardized, specialty curricula for use by interested colleges, thus facilitating both horizontal and vertical mobility of students through the ready transferability of college credits.
4. Work in liaison with other groups towards delineation of Maryland's health manpower needs, especially in relation to: increasing demand for care; new State and local health programs; and, changing patterns in the delivery of services.
5. Help develop in conjunction with the professional societies, new associate professional roles, including clear pathways for career advancement and the clarification of inter-agency issues, such as, minimum qualifications and licensing.
6. Develop a wide range of meaningful CONTINUING EDUCATION programs appropriate to all current personnel.

7. Investigate potential Federal, State and private funding sources; coordinate grant applications.

8. Maintain communication amongst both clinical and college members towards the most efficient utilization of faculty, expensive technical equipment, and physical plant; allow institutions with special attributes to specialize in areas of greatest capability, thus serving as the main training center, for that field, for the entire consortium.

9. Serve as a center for the training of clinical and basic-science faculty in educational methods; facilitate exchange of educational ideas and new approaches amongst faculty from all participants.

10. Coordinate recruiting efforts for health personnel, explore and develop new manpower resources, including use of indigenous health personnel drawn from and serving in the inner city.

REPORT

1967 - 1968

COMMITTEE ON ADMISSIONS

UNIVERSITY OF MARYLAND
School of Medicine

July 1, 1968

COMMITTEE MEMBERS:

Dr. Thurston R. Adams
Dr. William D. Blake
Dr. George Entwisle
Dr. Ollie Eylar
Dr. Jerome Merlis
Dr. Peter Rasmussen
Dr. Richard Richards
Dr. Theodore E. Woodward
Dr. Karl H. Weaver–Chairman
Dr. George A. Lentz, Jr.–Asst. Chairman

FACULTY INTERVIEWERS:

Dr. Harle Barrett
Dr. Raymond Clemmens
Dr. Thomas Connors
Dr. Everard Cox
Dr. Charles Crispens
Dr. John Dennis
Dr. Robert Derbyshire
Dr. James Durkan
Dr. Harlan Firminger
Dr. Paul Fiset
Dr. Edmund Glaser
Dr. Milton Grossman
Dr. Wilson A. Heefner
Dr. Martin Helrich
Dr. Mareen Henderson
Dr. Leo Karpeles
Dr. Vernon Krahl
Dr. Theodore Leveque
Dr. Eugene J. Limberg
Dr. Glen Lubash
Dr. James Lyon
Dr. T. Crawford McAslan
Dr. Joseph McLaughlin
Dr. Richard Munford
Dr. John O'Neill
Dr. Seymour Pomerantz
Dr. Frederick Ramsay
Dr. Paul Richardson
Dr. Bobby Rimer
Dr. M. J. Rosenholtz
Dr. Robert Schultz
Dr. David Simpson
Dr. Robert Singleton
Dr. Raymond Sjodin
Dr. M. Wilson Toll
Dr. Walter Weintraub
Dr. John Wiswell

OUT-OF-TOWN INTERVIEWERS:

Dr. Carmen S. Aguilo–Rio Piedras, Puerto Rico
Dr. Lawrence S. Cannon–Berkeley, California
Dr. C. Louis Jorgensen–Ogden, Utah
Dr. Leonard J. Morse–Worcester, Massachusetts
Dr. Max S. Sadove–Chicago, Illinois
Dr. Meredith Smith–Seattle, Washington

UNIVERSITY OF MARYLAND
School of Medicine
DISPOSITION OF ALL APPLICATIONS
for
Class of 1972

	Entering in	
	1968[1]	1967[2]
Total requests	2880	2713
Preliminary Information Forms released	2880	2713
Preliminary Information Forms returned	1914	1726
Requests for final applications denied	829	717
Final Applications released	1088	1009
Applications returned & processed	843	736
Applicants denied admission	451	371
Applications withdrawn before action	143	93
Offers sent out	223	246
Offers accepted	176	200
Offers refused	47	46
Accepted and later withdrawn	40	64
Matriculants	136	136
Alternates	26	26
Pending	0	0

[1] as of July 1, 1968
[2] as of June 1, 1967

DISPOSITION OF RESIDENT AS COMPARED TO NON-RESIDENT APPLICATIONS

	Resident		Non-Resident	
	1968	1967	1968	1967
Applications processed	324	286	519	450
Offers sent	155	157	68	89
Accepted	129	142	47	58
Applicants denied admission	128	94	323	277
Withdrew before action	23	18	120	75
Offers refused	26	15	21	31
Accept-later withdraw	19	32	21	32
Tentative Matriculants	110	110	26	26
Alternates	18	17	8	9
Pending	0	0	0	0

APPLICATIONS FOR ADVANCED STANDING*

	1968	1967
Applications	9	9
Accepted	3	3
Rejected	5	5
Withdrew before action	0	0
Pending	1	2

*These totals are not included in above grand totals

STATISTICAL SUPPLEMENT

% Change for [illegible]68[1] as compared to:

	1961[2]	1965[3]	1967[4]
Total requests	+64	+25	+6
P.I.F. returned and processed	+91	+13	+11
Final application forms released	+58	+34	+8
Final appl. forms returned & processed	+85	+47	+15
Request for final forms denied	+167	-5	+16
Applicants denied admission	+76	+38	+22
Applications withdrawn before action	+287	+127	+54
Offers sent	+41	+35	-5
Accept-later withdraw	+43	+82	-38
Offers refused	+38	+96	+2
Matriculants	+42	+6	0

[1] July 1, 1968
[2] June 9, 1961
[3] May 20, 1965
[4] June 1, 1967

	% Appl. sent offer			% App. matriculated		
	1961	1965	1967	1961	1965	1967
All applicants	34.7	30	34	21.1	22.3	18.5
Residents	67.6	50.2	54.9	49.1	39.6	38.5
Non-Residents	15.6	15.2	19.8	6.8	8.5	5.8

Women Applicants	Residents	Non-Residents	Total
Applications received	38	38	76
Offers sent	22	3	25
Rejected	11	23	34
Withdrew before action	2	10	12
Refused offer	5	0	5
Accept-Later withdraw	4	1	5
Tentative Matriculants	13	2	15
Alternates	3	2	5

STATISTICAL SUPPLEMENT (Cont.)

	sent offer	Rej.	% appl. sent offer	refused offer	accept later withdrew	% appl. matri.
All applicants	223	451	26.5	47	40	16.1
Residents	155	128	47.8	21	19	33.9
Non-Residents	68	323	13.1	26	21	5.0

MCAT - GPA Tentative Matriculants

Total Class = 136		Residents = 110	Non-Residents = 26
V.A.	552	548	568
Q.A.	599	597	606
G.I.	573	571	580
Sci.	577	569	610
*GPA	3.10	3.08	3.17
M/SCI GPA	3.08	3.07	3.13

1961**	1965(100)	1967(111)	1961**	1965(28)	1967(25)
V.A.	552	556		519	585
Q.A.	521	603		536	583
G.I.	585	582		547	581
Sci.	547	560		573	569
GPA*	2.89	2.97		2.93	2.97

( ) = Number in parenthesis - number in that category

**figures not available

Applicants accepting and later withdrawing

Total = 40		Residents = 19	Non-Residents = 21
V.A.	592	596	588
Q.A.	631	650	612
G.I.	616	633	598
Sci.	621	611	631
*GPA	3.25	3.28	3.23
M/Sc.GPA	3.28	3.29	3.26

Applicants refusing our offer

Total = 46		Residents = 26	Non-Residents = 21
V.A.	578	583	571
Q.A.	645	646	643
G.I.	598	597	599
Sci.	611	605	619
*GPA	3.30	3.22	3.39
M/Sc. GPA	3.34	3.30	3.40

*GPA = Calculated at time of application - not corrected for final (admission) GPA.

MCAT - GPA Tentative Matriculants (Cont.)

Applicants refusing our offer or accepting and later withdrawing

Total = 87		Residents = 45	Non-Residents = 42
V.A.	584	588	580
Q.A.	638	648	628
G.I.	606	612	599
Sci.	616	608	625
*GPA	3.28	3.25	3.31
M/Sc. GPA	3.31	3.30	3.33

*GPA = Calculated at time of application - not corrected for final (admission) GPA.

MATRICULANTS

STATE SOURCES

California	1	Puerto Rico	2
Illinois	1	North Carolina	1
Maryland	110	Pennsylvania	1
Massachusetts	3	South Dakota	1
Montana	1	Virginia	1
New Jersey	10	Washington	1
New York	2		136
Connecticut	1		

COLLEGE SOURCES

American Univ.	2	Hampden-Sydney	1	Wesleyan Univ.	1
Asbury College	1	Holy Cross	1	U. So. La.	1
Boston Univ.	2	Howard Univ.	2	U. Maryland	39
Bridgewater C.	1	J. H. U.	6	U. Michigan	1
Brown Univ.	2	Lehigh Univ.	1	U. Montana	1
Capital Univ.	2	Loyola College	5	U. Notre Dame	1
Catholic Univ.	1	Mt. St. Mary's	3	U. Pennsylvania	1
Columbia Univ.	1	Mt. St. Vincent	1	U. Pittsburgh	1
Dartmouth	2	Newark Coll.	1	U. Richmond	1
Defiance Coll.	1	Northern St.	1	U. Rochester	1
Dickinson Coll.	1	Notre Dame	1	U. Washington	1
Drew Univ.	1	Ohio St. U.	1	U. Wisconsin	2
Duke Univ.	1	Parsons Coll.	1	Wake Forest	4
Fairfield U.	1	Rensselaer	2	Wash. & Jeff.	1
Fran. & Marsh.	3	Sacramento St.	1	Wash. & Lee	1
Frostburg St.	1	Seton Hall	4	Washington U.	2
Georgetown U.	2	SUNY-Fredonia	1	Wellesley C	1
Geo. Wash. U.	3	Stonehill C.	1	West Maryland	2
Gettysburg C.	1	Syracuse U.	1	W. Va. Univ.	1
Graceland C.	1	Taylor U.	1	Wilmington C.	1
Gourcher	2	U. So. Calif.	1	Wittenburg C.	1
Cornell	1			U. Illinois	1
					136

MARYLAND COLLEGES

Goucher	2	Notre Dame	1
J. H. U.	6	U. Maryland	39
Loyola College	5	Western Maryland	2
Mt. St. Mary's	3		58

DISPOSITION OF COLLEGE PARK APPLICATIONS

	Res	Non-Res
Total Applications from College Park	80	8
Offers sent to College Park Applicants	44	1
Offers accepted by College Park Applicants	37	1
Rejected applicants from College Park	29	6
Withdrew before final action taken	2	1
Offer refused	3	0
Withdrew after acceptance	4	0
Alternates	5	0

MATRICULANTS WITH AND WITHOUT BACCALAUREATE DEGREES

All	124 With	12 Without

MATRICULANTS WITH OTHER DEGREES

M.S.	5
Ph.D.	1

STATE	1	2	3	4	5	6	7	8
California	1	21	5	–	–	–	27	–
Colorado	–	1	2	–	–	–	3	–
Connecticut	1	8	2	1	1	–	13	–
Delaware	–	5	2	–	1	–	8	–
D.C.	–	6	1	–	–	–	7	1
Florida	–	7	5	1	–	–	13	–
Georgia	–	1	–	–	–	1	2	–
Idaho	–	1	–	2	–	–	3	–
Illinois	1	16	2	–	–	–	19	–
Indiana	–	–	–	1	–	–	1	–
Iowa	–	1	–	–	–	–	1	–
Kansas	–	–	1	–	–	–	1	–
Kentucky	–	1	–	–	–	–	1	–
Maine	–	2	2	–	–	–	4	–
Maryland	110	130	23	26	19	17	325	6
Massachusetts	3	12	6	–	2	1	24	–
Michigan	–	2	1	–	–	–	3	–
Minnesota	–	4	–	–	–	–	4	–
Montana	1	–	–	–	–	–	1	–
Nebraska	–	1	–	–	–	–	1	–
New Jersey	10	65	27	3	7	2	114	–
New York	2	96	35	5	3	5	146	1
North Carolina	1	2	–	1	–	–	4	–
Nevada	–	–	1	–	–	–	1	–
Ohio	–	7	2	–	1	–	10	–
Oregon	–	2	–	–	–	–	2	–
Pennsylvania	1	35	16	2	4	–	58	–
Puerto Rico	2	4	–	–	1	–	7	–
Rhode Island	–	3	–	–	–	–	3	–
South Carolina	–	1	–	–	–	–	1	–
South Dakota	1	–	–	–	–	–	1	–
Texas	–	1	–	–	1	–	2	1
Utah	–	2	2	–	–	–	4	–
Virginia	1	8	2	2	–	–	13	–
Vermont	–	–	2	–	–	–	2	–
Washington	1	2	1	–	1	–	5	–

STATE	1	2	3	4	5	6	7	8
Wisconsin	--	--	--	2	--	--	2	–
West Virginia	--	4	2	1	--	--	7	–
Totals	136	451	143	47	40	26	843	9

1. Tentative Matriculants - As of July 1, 1968.
2. Rejected - Applicant denied admission.
3. Withdrew Before Action - Application withdrawn before Comm. action.
4. Refused - Applicant refused our offer of a place in the incoming class.
5. Withdrew After Accept. - Applicant accepted offer & then at a later date withdrew from the class.
6. Alternate - Given alternate status.
7. Total - Total number of applications received from this state or college.
8. Advanced Standing - Not included in total (Column 7).

2)

COLLEGE	1	2	3	4	5	6	7	8
Albion College	–	1	–	–	–	–	1	–
Albright Coll.	–	4	1	–	–	–	5	–
Alfred Univ.	–	2	–	–	–	–	2	–
Allegheny Coll.	–	1	1	–	–	–	2	–
Amer. Int. Coll.	–	1	–	–	–	1	2	–
American Univ.	2	–	1	1	1	–	5	–
Amherst	–	3	1	–	–	–	4	–
Antioch	–	1	–	1	–	–	2	–
Asbury Coll.	1	–	–	–	–	–	1	–
Assumption Coll.	–	1	–	–	–	–	1	–
Barnard College	–	1	1	–	1	–	3	–
Bates College	–	1	1	–	–	–	2	–
Beloit College	–	1	–	–	–	–	1	–
Boston College	–	5	–	–	–	–	5	–
Boston Univ.	2	4	1	–	–	–	7	–
Bowdoin Coll.	–	1	–	–	–	–	1	–
Brandeis Coll.	–	3	1	–	–	–	4	–
Bridgewater Coll.	1	–	–	–	–	–	1	–
Brigham-Young	–	1	1	–	–	–	2	–
Brooklyn College	–	6	2	1	–	2	11	1
Brown Univ.	2	–	1	1	–	–	4	–
Bucknell	–	1	–	1	2	–	4	1
C.W. Post Coll.	–	1	–	–	–	–	1	–
Calif. St. U.	–	1	–	–	–	–	1	–
Calif. West. U.	–	1	–	–	–	–	1	–
Capital Univ.	2	–	–	–	–	–	2	–
Catholic Univ.	1	2	–	–	–	–	3	–
C.C.N.Y.	–	6	–	–	–	–	6	–
Clark Univ.	–	1	2	–	–	–	3	–
Clemson Univ.	–	1	–	–	–	–	1	–
Colby	–	–	1	–	–	–	1	–
Columbia Union	–	4	–	–	–	1	5	–
Columbia Univ.	1	2	2	–	–	1	6	–
Cornell	1	4	.	2	1	–	10	–
Creighton	–	1	–	–	–	–	1	–
Dartmouth	2	2	–	–	1	–	5	–
Davidson	–	1	–	–	–	–	1	–
Defiance College								

College	1	2	3	4	5	6	7	8
Defiance College	1	–	–	–	–	–	1	–
Denison Univ.	–	–	1	–	–	–	1	–
Dickinson College	1	3	1	1	–	–	6	–
Drew Univ.	1	2	–	–	–	–	3	–
Drexel Inst.	–	1	–	–	–	–	1	–
Duke Univ.	1	6	1	4	–	–	12	–
D'Youville College	–	1	–	–	–	–	1	–
Edgewood College	–	1	–	–	–	–	1	–
Elizabethtown Coll.	–	–	1	–	–	–	1	–
Fairfield Univ.	1	1	–	1	1	–	4	–
Fairmont State	–	–	–	1	–	–	1	–
Fordham Univ.	–	5	3	–	–	–	8	–
Franklin & Marshall	3	4	1	–	–	–	8	–
Fresno State	–	1	–	–	–	–	1	–
Frostburg St. Coll.	1	1	1	–	–	–	3	–
Georgetown Univ.	2	4	–	–	–	–	6	–
George Washington U.	3	8	2	1	–	1	15	–
Georgia Tech.	–	–	–	–	–	1	1	–
Gettysburg Coll.	1	1	1	–	–	–	3	–
Graceland Coll.	1	–	–	–	–	–	1	–
Grinnell	–	1	–	–	–	–	1	–
Goucher College	2	2	–	–	–	–	4	–
Hamilton Coll.	–	1	–	–	–	–	1	–
Hampden-Sydney	1	–	–	–	–	–	1	–
Harpur College	–	2	–	–	–	–	2	–
Harvard	–	3	5	–	–	–	8	–
Haverford	–	1	–	–	–	–	1	–
Hiram College	–	1	–	–	–	–	1	–
Hobart College	–	1	1	–	–	–	2	–
Hofstra Univ.	–	1	1	1	–	–	3	–
Holy Cross	1	6	–	–	–	–	7	–
Houghton	–	1	–	–	–	–	1	–
Howard Univ.	2	2	–	–	–	–	4	–
Hunter College	–	3	–	–	–	–	3	–
Indiana Univ.	–	–	1	–	–	–	1	–
Johns Hopkins U.	6	25	6	7	5	–	49	1
John Carroll U.	–	1	–	–	–	–	1	–

College	1	2	3	4	5	6	7	8
Kent St. U.	–	1	–	–	–	1	2	–
Kenyon College	–	2	–	1	–	–	3	–
King's College	–	1	–	–	–	–	1	–
LaSalle Univ.	–	3	2	–	–	–	5	–
La Sierra	–	1	–	–	–	–	1	–
Lafayette	–	–	1	–	–	–	1	–
Lawrence Univ.	–	–	1	–	–	–	1	–
Lehigh Univ.	1	2	2	–	1	–	6	–
Le Moyne Coll.	–	1	–	–	–	–	1	–
Loyola College	5	3	–	–	1	–	9	1
Loyola U. (Chicago)	–	–	–	–	–	1	1	–
Loma Linda	–	1	–	–	–	–	1	–
Long Island U.	–	1	–	–	–	1	2	–
Madison Coll.	–	1	–	–	–	–	1	–
Manhattan Coll.	–	–	1	–	–	–	1	–
Marietta Coll.	–	1	–	–	–	–	1	–
M.I.T.	–	1	–	2	–	–	3	–
Miami U. (Ohio)	–	3	–	–	–	–	3	–
Michigan State	–	1	–	–	–	–	1	–
Middleburg Coll.	–	–	1	–	–	–	1	–
Millsaps College	–	–	–	–	–	1	1	–
Morgan State C.	–	5	1	1	–	–	7	–
Mt. St. Agnes	–	1	–	–	–	–	1	–
Mt. St. Mary's	3	5	–	–	–	–	8	–
Mt. St. Vincent	1	–	–	–	–	–	1	–
Muhlenberg	–	–	1	–	–	–	1	–
Muskingum Coll.	–	–	1	–	–	–	1	–
New York Univ.	–	14	2	–	1	–	17	–
Newark College	1	–	–	–	–	–	1	–
No. Carolina St.	–	1	–	–	–	–	1	–
Northeastern U.	–	2	–	–	–	–	2	–
Northern State	1	–	–	–	–	–	1	–
N.E. Mexico St.	–	1	–	–	–	–	1	–
Northwestern	–	2	–	–	–	–	2	–
Notre Dame	1	1	–	–	–	–	2	–
Oberlin Coll.	–	–	–	–	1	–	1	–

College	1	2	3	4	5	6	7	8
Occidental	–	–	1	–	–	–	1	–
Oglethorpe	–	1	–	–	–	–	1	–
Ohio St. U.	1	1	1	–	1	–	4	–
Ohio Wesleyan	–	1	–	–	–	–	1	–
Old Dominion	–	1	–	–	–	–	1	–
Parsons Coll.	1	–	–	–	–	–	1	–
Penn. State	–	8	2	–	–	–	10	–
Princeton	–	1	1	–	–	–	2	1
Providence	–	2	1	–	–	–	3	–
Purdue	–	–	–	1	–	–	1	–
Queens Coll.	–	2	2	–	–	–	4	–
Radcliffe	–	–	–	–	–	–	0	1
Randolph-Macon	–	2	–	–	–	1	3	–
Rensselaer	2	–	–	–	–	–	2	–
Rice Univ.	–	1	–	–	–	–	1	–
Roosevelt Univ.	–	2	–	–	–	–	2	–
Rutgers	–	19	10	1	2	–	32	1
Sacramento St.	1	–	–	–	–	–	1	–
San Diego St.	–	1	–	–	–	–	1	–
St. John's Coll.	–	–	–	–	–	1	1	–
St. Joseph's C.	–	3	–	–	–	–	3	–
St. Peter's C.	–	2	2	–	–	–	4	–
St. Lawrence U.	–	2	–	–	–	–	2	–
Sarah Lawrence C.	–	1	–	–	–	–	1	–
Seton Hall	4	9	–	1	4	1	19	–
Siena College	–	1	–	–	–	–	1	–
Simmons College–	–	–	–	–	1	1	–	
SUNY-Binghamton	–	–	1	–	–	–	1	–
SUNY-Buffalo	–	2	–	1	1	–	4	–
SUNY-Cortland	–	1	–	–	–	–	1	–
SUNY-Fredonia	1	–	–	–	–	–	1	–
SUNY-Queens	–	1	–	–	–	–	1	–
SUNY-Stoney Brook	–	2	–	–	–	–	2	–
So. California	–	1	–	–	–	–	1	–
So. Illinois	–	1	–	–	–	–	1	–
Smith College	–	1	–	–	–	–	1	–
Springfield Coll.	–	1	–	–	–	–	1	–

College	1	2	3	4	5	6	7	8
Stanford Univ.	–	–	1	–	–	–	1	–
Stonehill Coll.	1	–	–	–	–	–	1	–
Susquehanna U.	–	1	–	–	–	–	1	–
Sweet Briar Coll.	–	–	–	1	–	–	1	–
Syracuse Univ.	1	–	1	–	–	–	2	–
Taylor Univ.	1	–	–	–	–	–	1	–
Temple Univ.	–	4	–	–	1	–	5	–
Towson State	–	2	–	–	–	–	2	–
Trinity College	–	1	–	–	–	–	1	–
Tufts	–	2	1	–	–	–	3	–
Tulane Univ.	–	2	–	–	–	–	2	–
Tusculum	–	1	–	–	–	–	1	–
Union College	–	1	1	–	–	–	2	–
U. California	–	3	2	–	–	–	5	–
U. Cal.-Berkeley	–	1	–	–	–	–	1	–
U.C.L.A.	–	6	2	–	–	–	8	–
U.Cal.-San Bernardino	–	–	1	–	–	–	1	-
U. So. Calif.	1	–	–	–	–	–	1	–
U. Chattanooga	–	1	–	–	–	–	1	–
U. Chicago	–	3	2	–	–	–	5	–
U. Connecticut	–	1	1	–	–	–	2	–
U. Delaware	–	2	2	–	1	–	5	–
U. Denver	–	1	–	–	–	–	1	–
U. Florida	–	1	2	–	–	–	3	–
U. So. Florida	–	1	–	–	–	–	1	–
U. Illinois	–	3	–	–	–	–	4	–
U. Iowa	–	1	–	–	–	–	1	–
U. So. La.	–	–	–	–	–	–	1	–
U. Maine	–	1	2	–	–	–	3	–
U. Maryland	39	35	2	3	4	5	88	2
U. Md.-Pharmacy	–	2	–	–	–	–	2	–
U. Massachusetts	–	1	1	–	1	–	3	–
U. Miami	–	3	1	1	–	–	5	–
U. Michigan	1	5	1	1	1	–	9	–
U. Minnesota	–	2	1	–	–	–	3	–
U. Missouri	–	1	–	–	–	–	1	–
U. Montana	1	–	–	–	–	–	1	–
U. Nebraska	–	1	–	–	–	–	1	–

College	1	2	3	4	5	6	7	8
U. Nevada	–	–	1	–	–	–	1	–
U. New Hampshire	–	1	–	–	–	–	1	–
U. Notre Dame	1	–	–	–	–	–	1	–
U. No. Carolina	–	1	1	–	–	–	2	–
U. Oregon	–	2	–	–	–	–	2	–
U. Pennsylvania	1	10	4	–	1	1	17	–
U. Pittsburgh	1	7	5	–	2	–	15	–
U. Puerto Rico	–	3	–	–	–	–	3	–
U. Rhode Island	–	1	–	–	–	–	1	–
U. Richmond	1	–	–	–	–	–	1	–
U. Rochester	1	4	3	–	1	–	9	–
U. Scranton	–	–	–	1	–	–	1	–
U. Tennessee	–	1	–	–	–	–	1	–
U. Texas	–	1	1	–	–	–	2	–
U. Utah	–	1	1	2	–	–	4	–
U. Virginia	–	5	2	1	1	1	10	–
U. Vermont	–	–	2	–	–	1	3	–
U. Washington	1	–	–	–	1	–	2	–
U. Wisconsin	2	4	2	2	–	–	10	–
Upsala College	–	1	–	–	–	–	1	–
Ursinus College	–	–	1	–	–	–	1	–
Utah State Univ.	–	1	–	–	–	–	1	–
Valdosta St. Coll.	–	–	–	–	–	1	1	–
Vanderbilt Univ.	–	1	–	–	–	–	1	–
Villanova Univ.	–	3	2	–	2	–	7	–
V. M. I.	–	1	–	–	–	–	1	–
Va. Poly. Inst.	–	–	–	1	–	–	1	–
Wagner College	–	1	–	–	–	–	1	–
Wake Forest	4	1	–	–	–	–	5	–
Washington Coll.	–	2	–	–	–	–	2	–
Wash. & Jeff.	1	–	–	–	–	–	1	–
Wash. & Lee	1	–	1	1	–	–	3	–
Washington State	–	1	1	–	–	–	2	–
Washington Univ.	2	1	–	–	–	–	3	–
Weber State	–	1	–	–	–	–	1	–
Wellesley College	1	–	–	–	–	–	1	–
Wesleyan Univ.	1	–	1	–	–	–	2	–

College	1	2	3	4	5	6	7	8
Western Md.	2	5	1	1	–	2	11	–
West Va. Univ.	1	2	2	–	–	–	5	–
Western Reserve	–	1	–	–	–	–	1	–
Westminster	–	1	–	–	–	–	1	–
Wheaton College	–	1	–	–	–	–	1	–
Wheeling College	–	4	–	–	–	–	4	–
Whittier College	–	1	–	–	–	–	1	–
William & Mary	–	7	2	–	–	–	9	–
Williams College	–	1	1	–	–	–	2	–
Wilmington College	1	–	–	–	–	–	1	–
Wilson College	–	1	–	–	–	–	1	–
Wittenberg College	1	–	–	1	–	–	2	–
Yale	–	2	3	–	–	–	5	–
Yeshiva Univ.	–	1	3	–	–	–	4	–
Totals	**136**	**451**	**143**	**47**	**40**	**26**	**843**	**9**

1. **Tentative Matriculants - As of July 1, 1968.**
2. **Rejected - Applicant denied admission.**
3. **Withdrew Before Action - Application withdrawn before Committee action.**
4. **Refused - Applicant refused our offer of a place in the incoming class.**
5. **Withdrew before action - Applicant accepted offer & then at a later date withdrew from the class.**
6. **Alternate - Given alternate status.**
7. **Total - Total number of applications received from this college.**
8. **Advanced Standing - Not included in total (Column 7).**

Medical Schools selected by applicants who either refused our offer or accepted and later withdrew.

	Acc.-later withdrew		Refused our offer		
MEDICAL SCHOOL	**Res.**	**Non-Res.**	**Res.**	**Non-Res.**	**Total**
Colorado	–	–	–	A	A
Cornell	–	1	–	–	1
Dartmouth	–	1	–	–	1
Duke	1	–	–	1	2
Einstein	1	–	1	–	2
Emory	–	–	2	–	2
Georgetown	7	–	A1	–	8A
George Washington	2	–	A4	–	6A
Hahnemann	–	2	–	–	2
Harvard	–	–	1	–	1
Indiana	–	–	–	1	1
Jefferson	–	6	1	1	8
Johns Hopkins U.	2	–	1	1	4
Med. Coll. of Va.	–	1	1	–	2
Meharry	–	–	1	–	1
Mt. Sinai	–	1	A	–	1A
New York Medical	–	–	–	1	1
North Carolina	2	1	1	–	4
Ohio	–	1	–	–	1
Penn State	–	–	–	1	1
Pittsburgh	–	1	–	–	1
Rochester	1	1	–	–	2
Southern Calif.	–	–	–	A	A
Stanford	–	–	1	–	1
SUNY-Buffalo	–	1	–	2	3
SUNY-New York	–	–	–	2	2
Tufts	–	–	A	1	1A
U.C.L.A.	–	–	1	–	1
U. Cal.-S.F.	–		A	1	1A
U. Chicago	1	–	–	–	1
U. Michigan	–	–	1	–	1
U. Pennsylvania	1	1	2	A	4A
U. Virginia	1	–	2	–	3

MEDICAL SCHOOL	Acc-later withdrew		Refused our offer		
	Res.	Non-Res.	Res.	Non-Res.	Total
U. Washington		1	–	–	1
Utah	–	–	–	1	1
Vanderbilt	–	–	–	2	2
Wash. U.-St. Louis	–	–	–	1	1
West Virginia	–	–	1	1	2
Western Reserve	–	–	A	–	A
Wisconsin	–	–	–	2	2
TOTALS			6A	3A	9A
	19	19	22	19	79

A = Signifies that this applicant presently holds an acceptance at the school indicated and at least one other as of June 19th per A.A.M.C. Matriculation List.